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Address.

ON MEDICAL TESTIMONY.*

By J. W. COURTNEY, M.D., BOSTON.

Mr. Chairman, Fellows of the Senior Class:

I AM SORRY, indeed, for the complete inability to engage in extempore speaking, which compels me to consign in advance my ideas to paper. However, if you will bear with me, I will endeavor to lay before you very briefly certain practical facts, gathered from a rather extensive experience, concerning the giving of medical testimony in courts of law.

At the present time, this sort of testimony is derided by the press, and looked upon askance by the courts; and the entire blame for such a deplorable state of affairs rests upon the shoulders of certain men in our own ranks, but not deservedly, thank Heaven, upon the shoulders of the profession as a whole.

Tradition, precept, and daily contact with human misery, should keep men of our calling from knavery, but, unfortunately, they not infrequently fail to do so. And the result is that, from time to time, the ends of justice are sadly defeated by medical men who, under oath, emit theories of disease that are accepted as trustworthy scientific facts by jurors, but which would meet with nothing but contempt even in the humblest gathering of medical men.

Curiously enough, however, it is not always knavery on the part of our profession, which

brings about a miscarriage of justice. More than once I have seen the gallows or the electric chair cheated of its legitimate victim through the testimony of eminently conscientious medical men of broad experience, who permitted their judgments to be hopelessly warped by a pathetically childish credulity.

I shall not further proceed with this particular phase of my subject, but I will venture to emphasize the fact that there is in it much food for sober reflection, particularly for a group of men like yourselves, whose court experience is all before them.

At some time in his career, practically every physician, however unversed he may be in medico-legal medicine, is bound to be called to the witness stand,—a situation which, in the mind of the average medical man, is identical with that of the young recruit on the firing-line in modern warfare. The position of the physician on the stand is, in fact, comparable to that of the man in the trenches, the efficiency of each being strictly proportionate to the quality and amount of his ammunition and his ability to utilize it. Without clear-cut ideas, and the power to express them in language at once intelligible, not only to learned court and counsel, but also to the more or less heterogeneous collection in the jury-box, the physician's effectiveness as a witness is quickly annihilated by a withering fire of cross-examination, and by a disconcertingly palpable mixture of apathy and scorn on the part of the jurors.

This brings us to a subject of paramount importance—preparedness. What most perturbs the average medical witness, before he goes upon

* An address given to the graduating class of the Harvard Medical School, November 19, 1915.

the stand, is the apprehension that he may be quizzed upon forgotten fine points in anatomy and pathology. This apprehension is, for the most part, absolutely groundless. The majority of experienced cross-examiners know full well that such tactics generally serve only to lead the examiner and witness alike into a barbed-wire entanglement of terms, fatal to clarity of understanding on the part of the jury; hence to be avoided.

The attending physician in a given case is called upon to testify to matters of fact only, and he may always rest assured that if he confines his testimony to what he has observed about his patient, he will be protected by the court and by his own counsel from the endeavors of the opposing counsel to lead him into paths which only expert medical witnesses have a right to enter. Such being the case, the attending physician should never by any chance take the stand unless his knowledge of his patient's family and previous history is co-extensive with that of the nature and clinical expression of the illness in dispute. He may be sure that in the preparation of opposing counsel's case, these particulars will have been gone into with the most searching minuteness. And it is disconcerting beyond words to a medical witness on cross-examination to have thrust under his nose incontrovertible documentary evidence to the effect that his patient, whom he has assumed to be entirely trustworthy, has served time for criminal offences, or has for years drawn a pension for the bodily ailments alleged to be the result of the accident which forms the basis of the action in which witness is, at the moment, testifying.

Many general practitioners make very full notes of an accident, and of the attending symptoms, in cases which promise to be followed by court procedures, but rarely in others. This fact is usually brought out on cross-examination, and construed by opposing counsel as evidence of the partisanship of the witness. As a matter of fact, witness has the right to make as many notes as he pleases, and refresh his memory from them when he is on the stand, but such notes must be made at the time of the clinical observations they purport to describe. A witness who is knave enough to introduce records which are garbled, or in any respect demonstrably different from what they originally purported to be, simply lets himself in for a merciless grilling at the hands of opposing counsel, and a sharp admonition, if nothing worse, from the court.

It follows, then, that any attending physician who steps upon the witness stand, armed with all the medical facts of his case, and who adheres closely to these facts in giving his testimony, has little to fear from cross-examination. His troubles begin the moment he allows himself to be drawn into the realm of speculation, and to venture opinions based upon hypotheses. In such cases, I can assure him that unless his sensibilities are protected by a pachydermatous envelope,

they will receive wounds, the scars of which will never be obliterated.

For the comfort of the medical witness who is compelled to confine his testimony to statements of observed fact, let me hasten to say that the medical expert's journey through the mazes of court procedure is by no means along a primrose path. The latter's only *raison-d'être* as an expert is his highly specialized knowledge, gleaned from a wide experience in his chosen field of medical science, and Heaven help him if, on the witness-stand, he has the temerity to overstep the borders of this field. Heaven help him, even if he doesn't, for that matter. His testimony may embody the most advanced scientific thought of the day, but unless it is couched in simple terms, its sole effect upon the jury is generally a purely soporific one. Opposing counsel is swift to take note of this fact, and his cross-examination is apt to be inspired by scientific writings with which he and the jury likewise have a common familiarity; for example, those of Dr. Munyon, Lydia Pinkham, or even Mary Baker Eddy. Hence, the lot of the expert, like that of the policeman in one of Gilbert and Sullivan's operas, is "not a happy one." I will return to this subject later, with certain suggestions which may help to mitigate the hardships of court experience for the general, as well as the special, practitioner.

The present mode of procedure in our courts is, so far as medical testimony is concerned, not a particularly edifying one. To illustrate this point, let us take, for example, a case of the type which is most commonly met with in the every day work of the courts—an action of tort for personal injuries. In such a case, the plaintiff is practically always of the proletariat class; the defendant, a public service corporation, or an insurance company. The array of witnesses on either side is generally appalling. Of these the medical ones alone concern us. They are of two hostile camps, and prepared to attempt under solemn oath, to uphold opinions diametrically opposed, yet supposedly derived from a single given series of facts and observations.

The situation is a deplorable one, and nobody discerns the glaring wrong of it all with clearer vision than certain high-minded men from our ranks, who have long striven to procure legislative enactment looking toward the abolition of this evil.

To me, for many reasons, which I cannot here enumerate, it seems hopeless to expect that legislative appeal on the part of such men will ever be fruitful of the desired results. Hence, it is the bounden duty of every man in the profession so to shape his conduct toward cases which promise to eventuate in court proceedings, that due respect will be given his opinion, that he will not merit the biting sarcasm, the sneers, the railery and general brow-beating of opposing counsel. And most important of all, that through his efforts the ends of justice will really be accomplished.

Neither the ordinary medical witness, nor the expert, has any right, moral or other, to allow feelings of partisanship to warp his judgment, or color an opinion given under oath.

The attending physician must, of course, show the utmost loyalty to his patient, but this loyalty does not call for gross exaggeration, or, worse still, downright perjury on his part. His only legitimate function is to administer to his patient, with all the skill of which he is possessed; to observe carefully and minutely the manifestations of the patient's disorder, and, finally, when called upon, to go upon the witness stand and state what he has observed, together with such conclusions only as practical experience with similar cases allows him to draw therefrom.

In cases of accident involving a possible lawsuit, it is no part of his duty to endeavor to fix responsibility; and it should be beneath his dignity needlessly to frequent law offices, to trundle with claim-agents, or in any way to act as a quasi-legal go-between in proceedings looking toward the financial adjustment of his patient's grievances. These same principles apply with equal force to the medical expert. He also should never forget that, both in and out of court, his function is solely a medical one. And if his sense of honor is, as it should be, of the same high order as his intelligence, he will not stoop to petty tactics, born of offensive partisanship, and despised by judge, jury, counsel, and general public alike.

Let us picture, now, the attending physician and the medical expert in a given court-room, waiting their turn to go upon the stand. I have given testimony in several states, and I can assure you that in no others is the dignity of the law so forcibly impressed upon one's mind as in our own Massachusetts. Hence, the first thing the waiting medical witness should be wise enough to do, is to take his tone from that of the court. Upon the stand the witness' manner should never be flippant, nor should it bear the stamp of spurious ease. His answers to counsel should be rigidly responsive, and he should never volunteer a statement when no question is before him. He should have prominently in mind the fact that directly he steps upon the stand he is a servant of the commonwealth. This does not mean, however, that he is in any sense an advocate; quite the contrary. Therefore, he should always refrain from arguments with counsel. He will find it difficult, very difficult, at times to give the desired "yes" or "no" answer, but it is always better to try to do so. Witness will lose nothing by so doing, because both the court and his own counsel will see to it that he has later an opportunity to amplify his statement to his entire satisfaction. His language should represent an effort to meet with the understanding of the twelve men who will ultimately decide the case. He should sedulously avoid the answer: "Not necessarily," which never serves other purpose than to get him deeper into the mire of cross-examination. He should not

keep one eye on his own counsel and the other on his cross-examiner. His whole attention should be directed toward the jury. He should not constantly appeal to the court when crowded by legitimate cross-questioning, and above all things, he should never allow his voice to sink to an inaudible murmur. Neither should he allow a display of temper to betray itself by shrill or petulant tones. The man who learns quickly to keep his temper in his pocket has the making of a good witness.

Gentlemen, I could go on at greater length, but am stayed by the firm conviction that if the above simple suggestions were conscientiously followed by every medical witness in every case, court proceedings would soon lose their terror for men in our profession, the value of their testimony would be enhanced a hundredfold and there would soon be little left in the way of abuse of medical testimony for the legislature or any other governing body to correct. It is, therefore, most emphatically the clear duty of each and every one of you in your court activities to break away from evil tradition and start the much-needed work of regeneration.

Original Articles.

SIMPLIFIED METHODS OF TRANSFUSION.

By EDW. H. RISLEY, M.D., F.A.C.S., BOSTON.

The purpose of this article is not to describe a new technic, but to offer a few suggestions as to how any method used may be made simple and successful.

A great deal of almost mystery has surrounded the operation of transfusion in the past, mainly because of the delicate methods of technic necessary until quite recently. Transfusion should not be—and actually is not—a difficult procedure as we have been led to suppose.

Success depends on two factors: 1. The recognition and appreciation of how easily blood clots when coming in contact with any foreign substance other than vessel walls, and, 2. The possession of proper apparatus for counteracting clotting. Apparatus to be serviceable must be simple and sure to work and not too delicate. A great many clever devices have been invented to facilitate the technic and make the procedure one which can be safely and successfully used in the hands of the surgeon. So far, the procedure has been rarely undertaken by any but those skilled in the use of some particular bit of technic, and is not a procedure which the physician or general practitioner (as contrasted with the surgeon) cares to undertake.

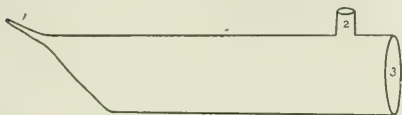
Transfusion is a device of such great service and the conditions in which it is used are generally so much of the emergency type, that a technic cannot be considered a safe and simple

technic that is not available for every physician and without the necessity of the beforehand tedious preparation.

Recently the use of sodium citrate to prevent clotting has been advocated, especially by Weil,¹ and simple technic developed by Lewishon,² and also Zingher.³

The author has recently tried out these and many other advocated methods in the laboratory and makes the following suggestions for those wishing to do transfusion, and who wish to have on hand simple means of assuring its success.

It occurred to us to try among other procedures, the collection of blood in a simple glass cylinder, uncoated with paraffin, but kept at body temperature by previous immersion in hot water (110°) and during transfusion wrapped in a hot towel wet in sterile water. This cylinder is a modification of the Kimpton-Brown⁴ tube which we find easier to handle and less breakable (see drawing), or practically the Vincent tube.



1. Cannula end with ground glass tip.
2. For bulb and tube (situated on side instead of as here drawn).
3. For cork stopper.

With two assistants and with good sized and accessible veins of both donor and recipient, blood could be transferred from one to the other without clotting in the warm tube, during the time of transfusion. This was always possible with two assistants and no delay in the process, but with only one or no assistant and with the necessary delay in effecting the proper opening of the recipient's vein, clotting was very liable to take place in the cannula end of the tube. We feel, however, that in the event of the breakage of one (of the two tubes generally on hand) or lack of time in which to recoat a second tube, the original tube may be rapidly washed out, first with cold then with hot sterile water and transfusion carried on with a reasonable expectation of success. This is offered simply as a suggestion which at some time might be successful.

Methods of transfusion have recently been revolutionized and greatly simplified by the introduction of the use of sodium citrate to prevent clotting.

Using one part of a 2% citrate solution to ten parts of blood, transfusion is made extremely simple, safe and sure by any of the various technics one wishes to employ. This of course applies only to indirect transfusion, which is the only method advocated at present.

The author is almost equally divided between the use of the uncoated glass cylinder and the

method by syringes. Both have their advantages. The apparatus necessary with the cylinder method, while more fragile, is much less expensive to provide oneself with. Good 20 to 50 c.c. syringes are very costly.

With easily accessible veins in the recipient, as in adults, the placing of 15 c.c. of citrate solution in the cylinder (not coated with paraffin) drawing 300 c.c. of blood, adding another 15 c.c. of citrate solution and thoroughly mixing the two, then introducing this into the recipient's vein (the recipient, for psychic reasons, being in an adjoining room), is most simple and safe.

Citrated blood can be kept several hours if necessary before being transferred to the recipient and it has also been demonstrated that the coagulation time of the recipient's blood after citrate transfusion was increased rather than decreased, as one would expect. This point we have not confirmed by laboratory test, but we have found no ill results from the use of citrated blood.

With infants, when the psychic element in the recipient need not be considered and smaller amounts are to be used, and perhaps in divided doses, the withdrawal of 20 to 50 c.c. of blood by aspiration from a vein in the bend of the elbow, (without the necessity of cutting down on the vein) into a syringe containing 2 to 5 c.c. of citrate solution, then adding the same amount at the end of aspiration, agitating the syringe so as to mix the two, then injecting into a small exposed (saphenous or external jugular) vein is also extremely simple and sure to work.

Most medical (as distinguished from surgical) men at present are familiar enough with the use of the needle in phlebo-puncture to be able to accomplish this readily.

Syringe transfusion can readily be done alone if small amounts are to be used, and with the aid of a nurse and one assistant to keep the needles in the veins of the donor and recipient free during the transfer of the syringe from one to another, by the injection of small amounts of weak (1%) citrate solution, any amount desired can be transfused with ease. The 16 gauge (B. & S.) needle used in salvarsan work will suffice, but the larger 11 gauge is much better.

It is also possible to do transfusion by the even simpler method of Lewishon,² who draws blood from the donor by means of an 11 gauge cannula plunged into the donor's vein, collecting it in an open beaker, in which the citrate solution is contained, and stirring the blood as it accumulates with a glass rod to ensure thorough mixing with the citrate. The citrated blood is then carried to the recipient and poured into an open funnel leading by a rubber tube and trochar to the recipient's vein, or introduced by means of a salvarsan apparatus. This is a simple method, but has the great objection that the blood necessarily comes into contact with the air a great deal.

The purpose of this paper is to point out the

¹ *J. Am. M. A.*, Vol. LXV, p. 425, 1915.

² *Med. Rec.*, Jan. 23, 1915; *Surg. Gen. and Obst.*, July, 1915.

³ *Med. Rev.*, Vol. LXXXVII, p. 440, 1915.

⁴ *BOSTON MEDICAL AND SURGICAL JOURNAL*, Vol. CLXIV, p. 783, 1913.

value of citrate solutions in transfusion and to show that almost any method can be made to succeed if this is used.

An adequate review of the history of the use of citrate solution is to be found in the articles referred to in the first part of this paper and is not considered necessary here.

We think we are justified, from our recent laboratory investigation of these methods, in recommending that every physician who contemplates doing transfusion at all, provide himself with the following apparatus:—

1. Two large (100 and 300 c.c.) glass cylinders. (See cut.) (Easily obtainable at any glass blowers for the small outlay of about two dollars.)

2. Five hundred c.c., in two bottles, of sterile, 2% sodium citrate solution. (This can be sterilized by boiling repeatedly without deterioration.)

3. A glass graduate (25 c.c.)

4. A set of glass syringes. (Two 5 c.c. and one or two 20 c.c.)

5. Two 16 gauge cannula-trochars.

With this layout we feel sure he will be able to do successfully any transfusion that he is called upon to do.

Since the completion of this paper, Simons of Nashville, Tenn., has published the record of three cases (*Jour. A. M. A.*, Oct., 16, 1915), receiving citrate transfusion, who suffered severe shock; and two ended fatally. These are the first instances reported by any one in which any ill effect has been noted with the citrate method. An analysis of Simon's first two cases shows symptoms entirely explainable on the ground of hemolysis which may happen in any transfusion. The reasons for the ill effects in the third case are not so clear.

We do not believe that these three cases should absolutely condemn the citrate method. If other men have had similar results they should be published immediately.

The method is so simple and has been attended by success in so many cases that we believe, when properly safe-guarded as an ordinary transfusion is, there should be no danger from its use.

INSANITY BY CONTAGION.*

By B. HENRY MASON, M.D., WORCESTER, MASS.

HISTORY affords us knowledge of psychic epidemics, occurring subsequent to and during the middle ages, that were of a hysterical nature. With the advance of civilization and intelligence, such epidemics in the enlightened part of the world no longer occur, in their former all-pervading fulness, with the exception perhaps of certain provinces in Russia, and there because of

an arrest of social development which has left certain remote populations in a state of mental childhood.

There appears to have been a strong religious element in most of the attacks, and the victims were said to be possessed by the devil and were called demonomaniacs.

Such an epidemic is said to have begun toward the end of 1609 in a convent of the Ursulines at Aix by the confession of Madeline de Mandol, a nun, who believed that she was possessed with demons who were operating under the command of a priest, Louis Gaufridi, a man of great honesty and strict morality. He was not able to convince the people that he was innocent, later became insane himself, and was finally burned at the stake. Many convents were the scenes of similar epidemics. The one at the convent of Sainte Brigitte appears to have lasted about ten years.

In 1860, an hysterical epidemic occurred at Versegne in Friuli; and in 1879, the paranoiac epidemic of Arcidosso was brought about by David Lazzaretti, an hallucinated person who believed that he was inspired by God. Though some time dead, it is claimed the prophet still has his followers.

Similar epidemics have been started by religious fanatics in this country. "In 1902," says Jacoby, "the population of a large country town, in Russia, was suddenly seized by a religious fanaticism and rushed into the church, destroying everything and crying, 'The Truth is coming!' They placed on the altar one of their own number, a man of no worth, whom some passer-by had invested with divine power.

Another form of psychic derangement is that of Lycanthropy, in which the victim believes he has been changed into a wolf through the agency of the devil; or the imagined transformation may be into other animals. This manifestation of mental aberration was of frequent occurrence during the 16th and 17th centuries, and isolated instances are now occasionally met with, though with certain modifications.

Tarantism or dancing mania is a form of mental alienation which has prevailed at different times both in Europe and in this country. The craze that has swept the country the past three years as a result of the modern dances is a contagion that might properly be put into the hysterical group.

Contagion when met with at the present time, usually displays itself in a more concrete form than it did a few centuries ago. The nature and degree of the contagion vary greatly. Tanzi states, "There is an hysterical contagion and a paranoid contagion which form the two opposite poles between which oscillate all the psychical epidemics and all the varieties of communicated insanity."

A careful analysis of cases of insanity by contagion reveals two facts that are fundamental in all such instances. First, there is always a predisposition on the part of the person who is the

* Read at the meeting of the New England Society of Psychiatry at the Massachusetts School for the Feeble-Minded, Waverley, Mass., Sept. 28, 1915.

subject of the contagion. Very frequently they are members of the same family who have been closely associated for years and whose interests and ambitions are in common. Especially is this an important factor when the secondary patient lived with the individual from whom he received the contagion during the formative or adolescent period of life. Second, the person who is the subject of the contagion is, to a certain degree, vulnerable to suggestion. When the two patients are separated, the one that is the subject of the contagion usually shows early improvement, soon throws off the morbid ideas and rapidly regains his normal mental equilibrium. Occasionally, however, when they have lived together a long time and have shared the same interest, habits, emotions and hopes, the passive individual will retain the delusions that have been acquired long after they have been separated, and possibly never entirely clear up. It is doubtful if insanity can be imposed by contagion upon a sound mind.

A delusive attitude may be imposed by a patient on a healthy person, for illustration: a man during the early stages of a paranoid condition, becomes suspicious of his fellow workmen, feels that his boss shows favoritism in his assignment of work and as a result his mercenary environment becomes unpleasant. He receives the sympathy of the members of his family until his delusional field becomes so complex and his ideas so absurd that they are forced to cease to harmonize with his belief. All persons who have to deal with the general public occasionally come in contact during the routine line of business, with instances similar to the one above cited.

Probably all men who have had experience in an institution for the care and treatment of the insane, have seen cases where a *friend* or relative harbored the idea that the patient had been "railroaded" or committed to the hospital by "fraud" and that his incarceration was unjust. The patient suffering from a paranoid condition complained of his persecutions. The friend immediately harmonizes with the patient's attitude and forms the conception that the patient is not deranged mentally, is subjected to the abuse of the hospital authorities, the nurses, and his other imaginary persecutors. The friend's activities may lead to wide publicity in the newspapers, or litigation and other annoyances to members of the family, his committing physicians and hospital authorities.

One individual may impose his systematized paranoid delusional concepts upon another who is intellectually weaker than himself. A feeble-minded person may be so weak mentally that the intelligence is, in every respect, unproductive, but if the intellectual powers are but slightly inferior to the normal, then the individual is predisposed to communicated insanity. Jacoby says, "When a paranoiac is a propagandist of mystical ideas, and reigns as sovereign or high-priest, it is the imbeciles who compose his court, and form the majority of his subjects."

A few months ago a man and his wife were patients at the Worcester State Hospital, and will serve as a good example of this form of communicated insanity:

J. G. and M. G. There is nothing of interest in the family history of the husband. He was born in the South in 1874 and came North when six years of age. His childhood was normal and he was a fair scholar. He was never very sociable, and although colored, most of his friends were among the white people. He was a steady and efficient worker. He was married six years before admission to the hospital and his home relations were pleasant.

The onset of his psychosis was gradual. Some time before his commitment, his friends began to notice certain peculiarities in his conduct. He developed the idea that people were jealous of him because he succeeded so well. Later an oppressive atmosphere came over him; he was able to detect a delicate odor for which he could not account, and mysterious things happened about the house. He finally appeared at the police station at 2 a.m., with his wife, requesting aid from the mysteries.

We have no knowledge of the wife's family history. She was born in the South in 1884, and although she attended school till fifteen years of age, she reached only the sixth grade. She lived with her aunt until fifteen, when she left her to go to work. Nothing is known of the patient's life from that time till about two years after her marriage. She has had one miscarriage, no other pregnancies. The history of onset in her case is almost exactly the same as that of her husband's with the exception that she first began to experience these annoyances only a few weeks before her commitment.

On their admission at the hospital, they both harbored the same persecutory ideas. The wife soon showed improvement, became industrious, sociable, and took up a normal mode of living. She admitted that all her suspicions were first uttered by her husband, but that she was convinced of them. When dismissed from the hospital about six months after her admission, she reluctantly admitted that probably she was mistaken about her experiences. The husband's ideas of persecution persisted without abatement throughout his hospital residence, and three months after leaving the institution, although self-supporting, and there had been no gross conduct disorders, his morbid ideas were active and he showed no insight.

At times a common suicide is arranged and may even be carried out. My attention has been called to an instance where two women committed suicide by drowning. One evidently suffered from a psychosis allied to manic-depressive insanity. It was claimed that there was no case of insanity on either side of her family. However, nothing was known of the father, and five of her brothers and sisters died in early childhood.

The other was a case of dementia precox with a marked history of heredity on the maternal side. She had made two former attempts to end her life. Both made marked improvement under institutional care and treatment so that they came to lead a very normal existence. They were transferred to a front ward, became ac-

quainted, a marked friendship developed between them and they were finally given parole of the grounds together. One day they failed to return at the usual time, and although a vigilant search was conducted, no trace of either could be found. A few days later their bodies were found near the shore of a body of water, where they had evidently walked in and together committed suicide by drowning.

It sometimes happens that insanity makes its appearance simultaneously in two people, usually who are closely related, when it is impossible to say which one may be the subject of the contagion.*

E. S. and A. S., two brothers, both patients at the Worcester State Hospital a few years ago, were born in New Hampshire, the older in 1871, the younger in 1873. Their paternal grandparents both lived to be over eighty. Their maternal grandmother had an attack of apoplexy at 80 and died a few months later. The maternal grandfather died of "softening of the brain" at the age of 77. An uncle was looked upon as a crank. Their mother was always regarded as queer and their father was a man who always kept his own counsel and had little to do with his neighbors, but was kind and obliging in cases of illness or misfortune of an acquaintance. Both boys had a regular childhood. They began school at the usual age and did very well in their studies. They left school together in 1891. They were always closely associated; did not care much for the company of others, but played together. The family and acquaintances always looked upon the younger as the leader, the originator; the older as the more silent and reserved.

After leaving school, they planned to begin college work the next fall, but the younger was not able to because of ill health, and the older would not go alone. A year later they went into vegetable gardening, at which they were successful, and continued until their commitment.

The onset, as observed by their parents, was absolutely sudden. About 7 p.m. both gave a scream and for three hours marched up and down from parlor to kitchen with loaded revolvers in their hands, but did not at any time threaten their parents. They said nothing and did not respond to questions. At the end of three hours, the older being exhausted, lay down on a bed that had been prepared for them in the parlor. The younger stood immovable for three hours more by the side of the bed. After that, they talked for a long time before going to sleep. The next day they did the chores, as they had been accustomed to do, as if nothing had happened. Another psychic episode led to their commitment two days later.

On admission, December, 1896, when taken to the ward, they kept step perfectly, each stepping with the right foot heavily. After their arrival at the ward, their behaviour was almost exactly the same, the older, however, setting the example and the younger imitating. At supper, the younger started to eat, but upon being advised by the other not to do so, stopped. They sat through the entire meal looking vacantly forward, occasionally spitting across the table. It required the combined efforts of four attendants to separate them at bedtime. The following morning, when visited by the physicians,

they were sitting on a settee, assuming the same attitude, the younger imitating the older in all his movements. They were made to walk down the hall, when they went hand in hand, and on again arriving at the settee, marked time until stopped and made to sit down. Later, when water was brought for them in a cup and a tumbler, they refused to drink until both were furnished in the same kind of a dish. Both drank simultaneously, taking down their glasses simultaneously. At the dinner table, they were placed directly opposite one another, but this time, instead of spitting across the table, spat in the middle of it.

A few days after their admission, they were separated by being placed in different wards. During their hospital residence, they both led the life of a catatonic dementia precox, characterized by mutism, food refusal, negativism, irritability and impulsiveness. The younger showed marked improvement for a time after being isolated, but his condition soon became stationary and remained so for several months. The older improved so that he was allowed to go home on a visit July, 1897, and was discharged as recovered two months later. The younger left the hospital October, 1898, on a 60 days' trial visit, and was discharged at the expiration of that time improved.

Subsequent History.—The older after his return home, according to his father, led a normal existence, with the exception of occasionally talking to himself and staring about in a peculiar manner at times. February, 1903, nearly six years after being discharged from the hospital, he went to Lowell, was arrested for misconduct and committed to the Worcester State Hospital the same day. He escaped from the lawn the following June and was discharged in September. Following his escape, he was arrested in Pennsylvania for carrying concealed weapons, in Connecticut for walking a railroad track, and in New Jersey for larceny. While waiting trial, he was allowed to go to Massachusetts, accompanied by two officers, to show them where a quantity of plunder was hidden. He led the officers into the woods and made a dive for liberty. He was tried for this offence and sent to the hospital for the criminal insane at Bridgewater by the Superior Court, June, 1904, where he is still a patient.

The younger, after leaving the hospital, took up his former occupation of vegetable gardening. Although quiet, reserved and peculiar in some ways, he is spoken well of by his neighbors, and is said to be one of the best poultry men of his town.

CONCLUSIONS.

1. Insanity by contagion, when met with at the present time, is more infrequent in its manifestation than it was a century or more ago.
2. It is probable that contagion occurs only in correlation with some underlying mental disorder.
3. A mild contagion may be met with when a presumably normal individual adopts a delusive attitude, but in whom a diagnosis of communicated insanity would not be justified.
4. One mentally deranged, usually of a paranoid bearing, may impose his delusional conceptions upon one whose mental caliber is below the normal.

* "Folie à deux" of the French writers.

5. A person hereditarily predisposed to insanity may be the subject of contagion when intimately associated with an insane individual.

6. The manifestations of mental disease may be simultaneous in two or more persons with an insane family taint.



NOTES OF A CONFERENCE ON THE MEDICAL AND SOCIAL ASPECTS OF SYPHILIS OF THE NERVOUS SYSTEM.

HELD AT THE PSYCHOPATHIC HOSPITAL,
MAY 27, 1915.

(Continued from Vol. clxxii, No. 27, page 1001.)

VIII.

LATENT NEUROSYPHILIS AND THE QUESTION OF GENERAL PARESIS—*Sine Paresi*.*

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WE wish to draw attention to a group of neurosyphilitic cases hitherto undescribed. The evidence for neurosyphilis in this group, of which four cases are presented in full, is (a) positive Wassermann reaction in the serum, (b) positive Wassermann reaction in the spinal fluid, (c) pleocytosis (55 or more cells in the c.mm.) in the spinal fluid, (d) excess of globulin (Nonne-Apelt test), and (e) of albumin (Mestrezat test) in the spinal fluid, together with (f) gold sol reaction in the spinal fluid consistent with neurosyphilis. Cases showing such immunological, cytological, and clinical features must in the present phase of syphilography be regarded as *syphilitic*, even though the presence of spirochetes has not been demonstrated. Moreover, the diagnostician would be safe in arguing an active process in the nervous system or its membranes, to which process it would be probably safe to give the name "*chronic inflammation*." The chemical changes in the spinal fluid would seem to warrant the idea that such cases are in some phase of *neural degeneration*, though

whether such degeneration is recent, subacute, or of long standing could not with certainty be stated.

In passing, it may be noted that each of the tests, (a) to (f), as above enumerated, is beset with certain technical difficulties, so that no cautious worker is disposed to accept everybody's offhand conclusion as to laboratory interpretations in these fields. Yet it seems likely that no one will bring in question cases in which all six tests are positive, since it is decidedly improbable that technical errors and errors of laboratory interpretation could conspire to yield positive but erroneous results in all six tests. For this reason we have chosen to present the four cases in question, omitting other cases in which fewer tests have been performed. Further down we present special features in the laboratory results having a theoretical bearing on general conclusions.

As indicated by our title, we are inclined to think that the laboratory findings point, not only to chronic inflammatory central neurosyphilis, but to that particular form of parenchymatous neurosyphilis known by its clinical name as general paresis. It must be confessed that generally speaking, the distinction of paretic from non-paretic forms of central neurosyphilis, none too easy on any grounds, is equally dubious from the standpoint of: (1) The six tests enumerated at the head of this article, as from (2) the bedside and (3) the post-mortem analysis.

Our reasons for terming these cases "*general paresis from the clinical laboratory point of view*" are naturally derived from the data of tests (c) and (f), since the spinal fluid cytology and the gold sol reaction alone exhibit conditions at all convincingly differential between the paretic and non-paretic forms of central neurosyphilis.

The interpretation of the spinal fluid pleocytosis, is between paretic and non-paretic neurosyphilis, is not attempted by most clinical laboratory workers. To be sure, it has been asserted that 100+ cells in the course indicated non-paretic syphilis and that 4-100 indicated paresis; but this simple distinction has not been substantiated, since a single case may run a large gamut from 4 to 200 or more.

We have been inclined to carry over the results of well-recognized post-mortem work to the clinical laboratory. Plasma cells are, of course, not pathognomonic for any disease whatever, although they may be thought to be far more characteristic of chronic than of acute disease (but one must remember the acute interstitial nephritis of Councilman). And it is, of course, generally accepted that plasmocytosis characterizes tuberculous as well as syphilitic meningitis and meningo-encephalitis.

But, as Alzheimer has carefully worked out, plasma cells are far more characteristic of the paretic form than of the non-paretic form of central neurosyphilis. His post-mortem micro-

*Being S. B. I. Contribution whole number 129 (1915,32). The general conclusions of this paper were read by Dr. Solomon at the April meeting of the Boston Society of Psychiatry and Neurology. (Bibliographical Note.—The previous contribution was by H. C. Solomon and H. I. Kestel, entitled "The Significance of Changes in Cellular Content of Cerebrospinal Fluid in Neurosyphilis," Boston Medical and Surgical Journal, Vol. clxxii, No. 27, page 1001.)

scopic studies of paresis and neurosyphilis indicate that, whereas plasma cells may occur in neurosyphilitic brain tissue, they occur in far smaller numbers. We have accordingly felt that the spinal fluid, clinically examined, was rather more likely to be paretic than non-paretic if plasma cells occurred. To be sure, the meninges do not contain, even in pronounced paresis, any such quantity of plasma cells as do the perivascular sheaths of the brain tissue. The plasmocytosis is a sign more of encephalitis than of meningitis. Clinically, of course, the lymphocytes far outnumber all other cell types both in non-paretic and in paretic neurosyphilis.

Accordingly, we present for what it is worth the fact that plasma cells were found to an appropriate degree in all these cases and indicate, so far as they go, paresis rather than non-paretic lues.

Turning to the gold sol reactions, we find, as stated, conditions consistent with syphilis. One case of the series (W. D.) showed a curve characteristic of paresis. The other three yielded curves of the same general form, but not such as are most characteristically or most frequently found in paresis.

According to some previous work of this laboratory, the process of flaking out of colloidal gold, which at the end of the standard period of observation (12 to 24 hours after the tubes are set up) yields the typical paretic curve, is a process that passes through phases suggestive of non-paretic syphilis. Observation of the tubes, at say, one hour or less after setting-up, shows the syphilitic curve even in series that are eventually to show the paretic curve. It is as if the undifferentiated non-paretic process was in some sense quantitatively less thoroughgoing, as it were, suspended in its course toward the paretic curve.

Finding one case with a typical paretic curve, we felt that the others might possibly be tending in that direction. At any rate, there was good evidence that a case with all known laboratory signs of paresis, including typical gold reaction, convincingly positive, could exist without clinical signs or symptoms of paresis.

Work from the laboratory has also shown that histopathologically typical paresis (post-mortem data) has evinced *intra vitam* the weaker gold sol spinal fluid reaction characteristic of undifferentiated neurosyphilis. And (as may be seen below in case of E. H.) a characteristic paretic reaction at one time may be followed by one of lesser intensity from the fluid of the same individual drawn at a later time. These findings led us to present these four cases in one group.

Presenting no such symptoms or signs, they have come to be given by us a variety of designations, such as latent neurosyphilis, or paresis, laboratory neurosyphilis or paresis, serological neurosyphilis, etc. For the paretic group, we

have assigned in practice names like pre-paresis, *paresis sine paresi*, non-paretic paresis.

These designations are far from exact. Pre-paresis, for example, is a term which has been used for a supposed group of general paresis cases, with symptoms and signs enough to warrant the diagnosis, but such that they could be cured, relieved or protracted by anti-syphilitic treatment. The doubt always remained whether such cases, antedating modern laboratory methods, were really cases of general paresis. Only time can tell whether our cases will go on to the eventual exhibition either of neurosyphilis signs and symptoms or of paretic ones.

Offhand, the question might be raised whether we are not perhaps dealing with phases of remission in neurosyphilis or paresis. The histories given below show that this can hardly be the case.

The flood of current literature on the general topic of neurosyphilis and paresis seems to be devoid of cases of this description. The reason that they have come to us lodges probably in the peculiar and to some extent unique nature of the Psychopathic Hospital clinic. We practice the Kraepelinian precept of giving every case with mental symptoms the benefit of a Wassermann serum test. The routine practice of this test naturally uncovers a multitude of unsuspected sins, as well as numerous cases of *lues insonitum*. Cases with positive serum we believe deserve, on every ground, a test of the spinal fluid. No present work exemplifies the importance of this matter.

The systematic literature is virtually silent as to latent cases of the group we here describe.

Much has been said as to the early diagnosis of general paresis. Little has been said, however, as to the diagnosis of a syphilitic involvement of the central nervous system as shown by these same signs before the beginning of symptoms. Interest has recently been aroused as to the finding in the fluid in the early stages of syphilis. This will no doubt throw great light on the later development of such a condition as general paresis. Still we have little or no knowledge as to the condition of the fluid prior to the onset of symptoms. Systematic works on syphilis of the nervous system or on general paresis give us practically no information on the conditions antedating the outbreak of symptoms. Thus Nonne in his *Syphilis und Nervensystem*, 1910, makes no mention of this matter. The article on Dementia Paralytica by A. Hoche in Aschaffenburg's *Handbuch der Psychiatrie*, published in 1912, offers no word on this subject. The following quotation taken from Moore's translation of Kraepelin's discussion of general paresis in the last edition of his text-book has no real bearing on the conditions existent before the outbreak of symptoms. He says: "The actual beginning of paresis consists, as a rule, of rather indefinite symptoms, which are usually interpreted as nervousness. They are apt to be excitability, a hasty, excitable, irritable, or

whining manner, anxiety states, absentmindedness, fatigability, mental dullness, forgetfulness, a tendency to sleep or persistent sleeplessness. Accompanying these are headaches, migraine with scotomate and vomiting, giddiness, cardiac palpitation, excessive sweating, rheumatoid pains, numb feelings, muscle twitchings, writer's cramp, brief weaknesses, abdominal cramps, intestinal obstruction. In the further course the mental and physical symptoms may progress collectively or individually with very irregular rapidity. Thus there are cases in which even severe disturbance of speech and writing with tabetic signs and lost reflexes may exist for a long time before any marked involvement of memory or intellect can be discovered. On the other hand, the mental symptoms may be fairly prominent, while physical examination reveals at first only indefinite and non-characteristic changes. This fact furnished a wide opportunity for errors in either direction, before the cytological and especially the serological tests afforded us a means of verifying our opinions even in the earliest stage of the disease."

Kraepelin here speaks of verifying our opinions. But suppose we had applied these cytological and serological tests a time previous to even the slightest suggestion of mental disorder, what then would have been the result, and if positive, how much could we argue as to the future course?

The following four cases are in point:

CASE 1. M. J. G. (1) Patient was admitted to the Psychopathic Hospital Dec. 30, 1914, being brought in by the police on the request of his wife, who stated that patient had threatened the lives of her and the children. Patient denied that there was any truth in this accusation, but admitted that he and his wife had a quarrel.

Family History. Grandparents died in old age. The father died at 53 of septicemia, was moderately alcoholic. Mother living and well at 72 years of age. Three maternal uncles, 6 maternal aunts. One uncle died in an accident, one died at 73, one a deaf mute (cause said to have been measles), died at 23 of "throat trouble." Two maternal aunts died in childbirth; four died in infancy, causes unknown. Patient's wife states that the father had tuberculosis and that the mother is alcoholic.

Siblings. (1) Boy died at 4 months from "influenza." (2) Patient. (3) John, died at 27, from pneumonia. Moderately alcoholic, married, no children. (4) Edward, died at 23 from tuberculosis. (5) James, 33, living and well. (6) Mary, 30, living and well. There were three stillbirths. Informant disclaims knowledge of nervous or mental disease or excessive alcoholism (except in one maternal uncle).

Past History. Patient was born 43 years ago, normal delivery and development. Has always enjoyed good health. He had measles and pertussis in childhood. Once had a small abscess on the neck. Some "rheumatism" since marriage. No headaches, no convulsions. Venereal disease denied by name and symptoms. Patient was married 18 years ago, the marriage being compulsory. Wife's health has been good. The first pregnancy resulted in a stillbirth. There are five children living and well. One

miscarriage 4 years ago. Wife states that patient has been alcoholic for at least 19 years, that he has been arrested six times for drunkenness over a period of more than 8 years; he has twice served sentences at Deer Island for drunkenness and non-support. He describes the symptoms of an attack of delirium tremens a number of years ago. Wife further states that their married life has never been happy, that they have quarreled a great deal and that she has left him several times. She says he has always been erratic, excitable, quick tempered, jealous, lacking in a sense of responsibility, and showed little regard for his children. Wife has been instrumental in several of his arrests.

Present Trouble. Just before Christmas patient accidentally discovered that wife had purchased a bill fold without his knowledge, and he could not imagine where she had obtained the money. A quarrel ensued and then she reported him to the police. The police called at his house, but found him quiet and well possessed, so did nothing about it. Patient then went to the police station to inquire of the captain the reason for the visit. The captain interviewed the wife and then had patient sent to Psychopathic Hospital for observation. Wife's statement was that patient "had walked up and down the room like a maniac, and stated that there would be a tragedy in South Boston," which she interpreted as a threat. The wife is said to be a trouble-maker and not over-reliable.

On admission to hospital the patient was quiet and showed no conduct or emotional abnormalities.

Physical Examination. (Jan. 1, 1915.) Well developed and nourished, pleasant appearing man of middle age. Hair plentiful on head, slightly tinged with gray. Head presents no scars or lesions. Face is symmetrical. Eyes and ears negative to external examination. Throat shows nothing of note. No thyroid enlargement, no visible pulsations in neck. **Glandular system:** No general adenopathy, some small shot-like glands palpable in the inguinal regions. **Chest:** Negative. **Circulatory system:** Cardiac impulse neither seen nor felt. The heart is not enlarged; the area of relative cardiac dullness is 10½ cm. to the left and 2½ cm. to right of mid-sternal line; upper border of dullness in third interspace. Sounds regular and of good quality; no murmurs heard. Rate 64 per minute. Blood pressure: systolic 130, diastolic 90. Radials not sclerosed, easily compressible. Pulses are regular, equal and synchronous. **Abdomen:** level with the thorax, muscular development is good. Upper border of liver dullness at fifth space; lower border not felt. Spleen not felt. No tenderness or spasm anywhere in the abdomen. Venereal disease denied. **Skin:** Uniformly of good quality. A few minor superficial scars on legs and shoulders. **Extremities:** Hands, cold and cyanotic. No deformities. Slight varicosities of both legs. No edema.

Neuromuscular system. Pupils are equal, very slightly irregular, especially when fully dilated, and react promptly to both light and accommodation and consensually and hold well. Extraocular movements well performed. No nystagmus or strabismus, no diplopia, no ptosis. Visual fields normal. No facial palsies or weakness. Audition good, air conduction better than bone conduction. No tremors of face. No difficulties of deglutition. No speech defect. Tongue projects medially without tremor. Pharyngeal reflex active. Biceps and triceps reflexes are active and equal on the two sides. There is no tremor of the outstretched hand. The

abdominal reflexes are obtained equally in the four quadrants. Cremasterics are equal on the two sides. The knee-jerks are very lively, equal on the two sides as are the Achilles. No patellar or ankle clonus. No Babinski, Gordon or Oppenheim. No Romberg. No gait disturbance. Deep muscle and joint sense good. Cutaneous and pain sense unimpaired. No ataxia in finger-to-finger and finger-to-nose tests.

Urine examination negative.

Wassermann reaction in the serum. Positive cholesterinized antigen, negative with fetal syphilitic antigen.

Wassermann reaction in the spinal fluid(?)

Globulin++++ albumen +++, cells 113 per cubic c.mm.; small lymphocytes, 84.1%; large lymphocytes, 14.5%; plasma cells, 0.8%; endothelial cells, 0.6%.

Gold sol reaction, 443+332+1±00.

Mental examination disclosed little of note. The orientation was intact. Memory for remote and recent events was excellent; school knowledge was well retained. He showed an excellent grasp on current events. There was no evidence of hallucinations. The flow of thought was connected, fluent, relevant. The emotional reactions seemed normal. In the hospital his conduct was in no way remarkable. The only thing at all suggestive was his ideas about his wife, showing some jealousy and anger on account of her part in his former arrests and present detention. Still there was some evidence that these were not without cause.

We see then a man with a history of alcoholism lasting over a period of at least nineteen years, who during this period had much trouble with his wife, who on several occasions had had him arrested, and who once more on account of difficulties with his wife was arrested and this time sent to the Psychopathic Hospital. His physical and mental examination proved to be essentially negative, and before the report of the Wassermann reaction and examination of the spinal fluid the diagnosis was made of chronic alcoholism, not insane.

On account of the serological findings it was considered advisable to have the patient investigated further and he was committed to the hospital for sixty days' observation. However, during his stay in the hospital until his discharge on Feb. 17, 1915, fifty days, nothing transpired that suggested a psychosis. On Jan. 22, he was presented at staff meeting and his case carefully discussed. There happened to be present at this meeting several superintendents and clinical directors of other state institutions beside the staff of the Psychopathic Hospital. All concurred that there was insufficient evidence to make diagnosis of a psychosis, and it was generally agreed that if there was a paranoid condition showing itself in jealousy and irritability, it was more likely due to alcohol than to syphilis.

On Feb. 15, 1915, the examining physician reported to the court: "While his blood and spinal fluid show a positive Wassermann, indicating probable beginning general paresis, yet his mental condition is not such as to warrant his commitment as insane, and we therefore recommend that he be discharged."

CASE 2. E. H. (1) Patient was admitted to the Psychopathic Hospital, Oct., 29, 1914, being sent here from a general hospital where he had gone on account of a self-inflicted wound of the wrist, ap-

parently made in a period of depression with suicidal intent.

Family History. Paternal grandparents both died of heart disease. Maternal grandfather died at 72 of dropsy. Moderately alcoholic. Maternal grandmother died of shock at 56. Father died at age of 40, after an illness of eight years, from heart disease. All his life was subject to fainting spells and headaches. The only paternal cousin died at 13 months of brain fever. Mother, aged 47, is to say the least, eccentric. Says "she has several times been given up from tuberculosis." Mother married twice. Two maternal uncles died of tuberculosis, one from a rupture, one from heart disease. One uncle who "doesn't know anything after he has a teaspoonful of liquor." Several other uncles and aunts whose history is not obtained. Patient is mother's only child. There were several miscarriages by both husbands; patient child by first marriage.

Past History. Patient born 32 years ago, full term, normal delivery and development. Measles, mumps and chicken-pox in childhood. Subject to headaches since seven or eight years old. Kicked in the face by horse at 17 or 18, not considered serious. Hit by a baseball three or four years ago leaving him hard of hearing on left side. Married ten years ago; no children because he says his wife needed an operation. He denies venereal disease by name and symptoms. For past 10 years has had attacks of depression lasting but a short time, but quite severe. Never caused him to quit work as a barber and he felt better when working. His married life he says was fairly happy except for his wife's extravagances, and on this account he left her a little over a year ago, and she has applied for a divorce, which he is willing that she should have, but does not wish to give her alimony. He admits moderate alcohol.

Present Trouble. Patient states that since he left his wife a year ago he has felt sorry a number of times. He has wished he had her back. He has felt lonely. He has had 6 or 8 periods of depression in that time similar to those he has had for many years, lasting two to three days, and sometimes a week. These were always precipitated by some cause for worry. In these attacks he feels nervous, sleeps poorly, has little or no appetite, sweats during his work, and everything looks black. Several times in these attacks he has had suicidal ideas. Ten months ago he considered taking corrosive sublimate. For a little over a week before entrance to hospital he had been out of work and had been "sporting." The day before entrance he had a telephone message from his lawyer which upset him somewhat and he walked the floor all night. He had just been shaving when the idea of suicide came to him. He sat down a minute when suddenly the thought "to hell with the world" came to him, he took the razor and slashed his wrist. He does not remember drawing the razor across his wrist. As soon as he saw the blood he felt sorry, called his mother and was taken to the hospital and then sent to the Psychopathic.

Physical Examination. Patient is a well developed and nourished man 32 years of age. Head is normal as to size and shape; there are no scars or marks of injury. Hair and skin not remarkable in any way. Ears negative to external examination. Teeth well kept; two missing, several gold fillings. Tongue very slightly coated. Throat negative. Tonsils easily visible without evidence of inflamma-

tion or exudation. *Neck:* No thyroid enlargement, no abnormal pulsations, no adenopathy. *Chest:* Symmetrical, expansion good, resonant throughout. Breath sounds transmitted normally. No râles or rûbs heard. *Heart:* No enlargement or cardiac dullness. Sounds of good quality, no murmurs heard. Rate regular. Pulses equal, regular and synchronous, and of good volume and tension. Systolic blood pressure 130, diastolic 65. *Abdomen:* Flat, soft and tympanitic throughout; no masses; no tenderness. *Liver* edge not felt below costal margin. *Spleen* not palpable. *Extremities* negative, except for incised wound on left wrist.

Neuromuscular Examination. Pupils are large, round, regular, equal, and react readily to light and accommodation. No nystagmus, strabismus or ptosis. No weaknesses or paresis of *facial muscles*. The *tongue* projects medially and shows no tremor. The *triceps* and *biceps* reflexes are readily elicited and are quite active as are the *knee jerks* and *ankle jerks*. On one occasion it was thought that the tendon reflexes were slightly more active on the left than on the right. This was never confirmed and always after found equal. There was no tremor of extended hands. *Abdominal reflexes* not elicited. *Cremasteric* present on both sides. The *Plantar* response is flexor. There is no Babinski, Gordon or Oppenheim. No Romberg. Coordination tests well performed. No speech defect. No sensory disturbances. Urine examination negative.

Wassermann reaction in serum: Positive with cholesterinized antigen; negative with syphilitic fetal liver antigen.

Wassermann reaction in fluid positive on two occasions. Examination of spinal fluid Nov. 4: Globulin +++, albumen ++, 100 cells per c.mm., large lymphocytes, 8%; small lymphocytes, 90%, plasma cells, 0.7%. Endothelial cells, 1.3%. Nov. 11, globulin +++, albumen +++, cells 18 per c.mm. Nov. 26, globulin ++, albumen ++, cells 92 per c.mm., large lymphocytes, 13.1%; small lymphocytes, 82.1%. Plasma, 1.2%. Endothelial 3.6%.

Gold sol. Nov. 4, 5555432100.

Gold sol. Nov. 26, 3332100000.

Mental Examination. On entrance to hospital patient seemed slightly depressed and a bit irritable. This condition lasted two days, after which he was agreeable and apparently entirely over his depression. Even during his mild depression, however, he talked freely. There was no evidence of retardation. He told his story readily. Orientation was intact. Memory excellent. Educational knowledge well retained. There was no evidence of any hallucinations or delusions.

There was then on the mental and physical examination nothing to make a definite suggestion of a psychosis, and the most one could think of was a psycho-neurosis or a cyclothymia of at least ten years' duration. The findings in the cerebrospinal fluid and the Wassermann reactions, however, give us material for thought. Certainly one cannot call the man insane; all who saw him agreed on this point.

CASE 3. W. D. (1) Patient on entrance to hospital March 23, 1914, was very excited. He was arrested for shouting and blocking traffic.

The physical examination at this time is entirely

negative. Patient is a large, well-developed man. The general system shows no abnormalities. The pupils are round, regular and equal, and react readily to light and accommodation. There is no muscular weakness or palsies. The tendon reflexes are all normally present and equal on the two sides. There is no Romberg, no ataxia, no sensory disturbance. There is some slight tremor of the extended hands, apparently the result of alcoholism, which disappears in the course of several days. There is no speech defect, no difficulty in writing. Diadochokinetic movements well performed.

The day after entrance patient had a seizure without loss of consciousness, characterized by rigidity of the body. The right arm was raised above the head and patient stared straight ahead. There was no movement in the muscle groups other than those necessary to bring the arm above the head. Lacrimation was increased, the head turned to the right. No reaction of the pupils demonstrable, knee jerks and Achilles jerks not changed. There were several loud screams during the attack, which lasted but a couple of minutes. After about one minute, when spoken to, patient turned toward examiner, breathing stertorously and moaning slightly. He composed himself on the bed and after another moment was ready to talk. He said he saw everything light up in front of him. He remembered the examination that was made.

Mental examination on admission showed that patient was very active and tended to be euphoric. He laughed frequently and often apparently without reason. He was very playful. He was well oriented. Memory for remote and recent events good. School knowledge well retained. Grasp on current events good. No delusions or hallucinations made out. At the end of a week he was quiet, no longer tended to be euphoric, playful or break out with uncontrolled laughter. He realized that he had been "nervous" and not himself.

He admits alcohol to excess for many years. Had delirium tremens several years ago in Chicago, at which time he was in a hospital. At other times when drinking heavily he had auditory hallucinations. None for several years, however. Two years ago he was in the Boston State Hospital for a time for an attack of maniacal excitement, where the diagnosis of manic-depressive insanity, manic phase, was made. He recovered shortly and was discharged.

The routine Wassermann reaction on the blood serum was reported positive. Lumbar puncture was performed. The findings were: globulin +++, albumin +++, cells 121 per c.mm. Gold test typically for general paresis, 5555321000.

By the time the spinal fluid findings were reported patient had entirely cleared up mentally so that aside from the laboratory findings there was nothing of note either mentally or physically.

The patient remained in the hospital until July 22, 1914, during which time he has had some treatment. During these four months of observation there appeared no psychotic or physical sign other than already noted.

CASE 4. F. B. (1) Patient was brought to the hospital by the police. He was charged with having forged a check and on account of the crudeness of the work, his mental condition was suspected.

Family History. The paternal grandfather was considered fast, drank a great deal and was said to be a thief. The father is said to have been forced to

leave the state when a young man in order to avoid the reformatory. Paternal cousin murdered a man; the sisters of this cousin said to have been wild and one brother married a prostitute. Nothing known of maternal relatives.

Past History. Medical history is unimportant. He denies syphilis. His early childhood is of little significance. He was somewhat dull in school. At about the age of 12 he began to lie and steal, and has continued this ever since. His attempts have all been very crude, it is said, and when confronted he would strenuously deny his deeds even when the evidence was overwhelming. He forged checks, borrowed money from all his friends, and charged things at stores to the family. The family paid the bills for a time and then later had him sent to a reform school. He was married at 19, but wife has left him and obtained a divorce. He has been excessively alcoholic for years and is suspected also of taking drugs. He was discharged from the navy dishonorably. He later joined the army and was discharged from there on account of "rheumatism," according to his account, but in reality deserted. He finished a jail sentence of 13 months for forgery a little over a year ago.

Physical Examination shows a well developed and nourished man. The general physical examination is negative. The lungs show nothing abnormal. The heart is not enlarged, there are no murmurs or irregularities; blood pressure 145 systolic. The alimentary system is negative. No palpable lymph glands. *Neuromuscular examination:* Pupils equal and react to light and accommodation. Extraocular movement well performed. Tongue projects in the median line, with no tremor. There is no evidence of facial paresis or weakness of the muscles. The biceps, triceps, knee jerks and ankle jerks are present and equal on the two sides. There is no Gordon, Babinski, or Oppenheim, no ankle clonus. There is no tremor of the extended hands. No Romberg sign. There is a little difficulty in the finger-to-finger test. There is no sensory disturbance either subjective or objective. No tenderness over nerve trunks.

Mental Examination shows nothing of a psychotic nature. Patient is well oriented; memory for remote and recent events is well preserved, school knowledge well retained, grasp on current events good; no delusions or hallucinations elicited. Patient is not feeble-minded, according to the intelligence tests of Binet and Simon, and Yerkes-Bridges, but shows poor attention and gives evidence of weakness in the volitional spheres; is very suggestible.

To summarize the case, then, we have a man of 30 years of age who has shown criminalistic and anti-social tendencies since childhood, whose general physical and neurological examination is negative (excepting the laboratory tests), and whose mental examination shows no psychotic symptoms, that he is not feeble-minded. In other words, with the exception of the serological and chemical findings in the blood and cerebrospinal fluid, there is nothing to suggest that he is more than a criminal type.

Wassermann reaction in blood serum positive.

Wassermann reaction in cerebrospinal fluid. Examination of cerebrospinal fluid: globulin ++, albumen ++, cells 55 per c.mm. Large lymphocytes, 9.1%; small lymphocytes, 90%; plasma, .9%. Gold sol reaction, 3+3+ 2 1 0 0 0.

These four cases have in common the laboratory tests characteristic of general paresis or cerebrospinal syphilis, and yet no other signs or symptoms that would cause us to consider these diseases. In no case was general paresis considered until the results of the blood serum, Wassermann and spinal fluid findings had been reported. Repeated examination with this knowledge in mind still did not disclose anything to suggest syphilis of the central nervous system. It is true that in one case (W. D.) the slight convulsive seizure might be considered a paretic phenomenon, but in the light of the alcoholic history it was considered as a phenomenon of alcoholic epilepsy.

Further, these four cases show some evidence of psychic peculiarities existing over a period of a number of years. We refer to excessive alcoholism, delirium tremens, hallucinations of an auditory character, marked irritability, criminalistic tendencies, or depression. In other words, these cases had for years exhibited phenomena such as were the immediate cause of their being brought to the hospital, and if one suspects these peculiarities to be mental phenomena of paresis, one has to consider that they have lasted for more than ten years without progressing and without exhibiting any physical signs.

It is at least certain that these patients have some form of cerebrospinal syphilis. It is quite true that we have no way of prophesying the outcome. This may simply be the very early stage of a general paretic process before the mental and physical symptoms have appeared. In that case the prognosis would seem to be very poor. Is this the usual story of paresis, that the serological findings are present long before the symptoms of the disease?

This would have a considerable bearing on the question of allergy that has recently been so much discussed, especially by Swift and Ellis, and Head, Fearnside, Fildes and McIntosh. We know that certain cases of paresis which at autopsy show marked pathological changes characteristic of this disease may show symptoms for a comparatively short time. These findings may be the result of a small focal area of spirochaetosis, a localized meningitis. Still this means a syphilitic infection of the central nervous system. While it is possible to conceive of stationary conditions, such as we find late in tabes, yet this is not a safe idea to go on, and in such a case the serology is negative.

In this relation it is interesting to recall that paresis not infrequently first shows its symptoms as the apparent result of head trauma. Mott says that this is the exciting factor in a number of his cases. This would leave no other explanation but that the process was already in progress but showed no symptoms. In other words, this would represent theoretically the condition that we have found practically in these cases.

Here we are again brought to the consideration of treatment. Despite the various methods

of attack, and the occasional enthusiastic reports, the general consensus of opinion remains unchanged, that there is no method of therapeutically affecting general paresis. On the other hand, since the work of Fournier, it has been held that syphilis well treated but rarely leads to paresis. Somewhere, then, after the infection, there comes a time before which treatment is of great value and after which it is of little avail. Recent work has tended to show that involvement of the central nervous system is a not uncommon occurrence in the secondary stage of the disease (Weil and Stokes), so that this is not merely a question whether or not the central nervous system is involved. *A priori*, there is nothing to argue against the possibility of therapeutic result at this stage of central nervous system syphilis, and we may in this way be able to prevent general paresis or cure it if we consider this condition general paresis.

It may be held that it is not possible to speak of paresis without symptoms other than those shown by the laboratory. Would one hold the same viewpoint in regard to the diagnosis of nephritis and diabetes from the urine findings?

There is a condition called latent syphilis, the relation of which to active syphilis is very similar to that of this *latent neurosyphilis* to the more active forms.

One illustration of this relation of latent syphilis and neural syphilis is found in the so-called neuro-recursive. In these cases there is for a time only a positive Wassermann reaction, with no subjective or objective symptoms. Suddenly something happens, perhaps an ocular palsy, perhaps a ptosis. There is no question here but that we have been overlooking in such a case the real significance of the positive Wassermann when we said "latent." So much more have we no right to take this attitude in the cases above described where there is definite evidence of an inflammatory reaction of the central nervous system.

One must indeed keep these cases in mind when considering remissions and recoveries of "general paresis" under treatment. We have learned that many cases which, from the mental picture, might be diagnosed as general paresis, show none of the serological findings of this disease. We have also found that certain patients giving the clinical picture of other mental disease, *e.g.* manic-depressive insanity, will give the six reactions and thus enable us to make a correct diagnosis of paresis very early. This fact is so impressive that it is very easy to feel that the serology is the last word. But when one finds such cases as here described, in which the serology is the same as in true full-blown cases of general paresis and yet no symptoms, either mental or neurological, present, one must admit that the serology is not the whole story. Unfortunately we do not know the prevalence of such a condition. Still, with the frequency of other forms of mental disease, it would not be at

all surprising to find the two conditions existing in the same patient. If such a patient has an attack of manic-depressive insanity, with the serology positive, one would diagnose general paresis. When such a patient then has a remission from the attack of manic-depressive insanity, he would be considered as a remission in paresis. If such a patient then has treatment, one is prone to feel that the recovery was at least in part due to the treatment. Such a state of affairs may be the explanation in the case of F. A., described below. Suppose we had seen M. J. G. in an attack of delirium tremens, such as we had previously, would not we have considered it general paresis? Such was indeed in all probability the situation in the case.

CASE 4. F. A. (1) Patient was admitted to hospital Jan. 1, 1915, in a very much excited condition. The family history is very meagre, and all that is of significance is that mother has always been very "nervous."

Past History. Very healthy as a child, and except for occasional throat trouble and headache had no physical ailments until 8 years ago, when she had an operation for appendicitis, and $2\frac{1}{2}$ years ago was operated for hernia and adhesions. Following this she began to show a lack of energy, neglected her housework, was much depressed, wept frequently, complained constantly of pain in various places and was ill-tempered. In about five months she improved, and then after a couple of weeks at the shore seemed entirely well.

Present Illness. In November, 1914, that is, about 17 months after the recovery from the previous depression, she again began to show practically the same symptoms. She was depressed, could not sleep and would get up in the night and sew; was self-centered and hypersensitive, then became restless and nervous; wanted to go shopping and out for dinner; went to New York and then to New Bedford. Symptoms became more marked; she became very ill-tempered; threatened her husband when angry over trifles, threatened suicide, then began to get active and spend money extravagantly. At the end of two months, that is, January 1, 1915, she was admitted to the hospital.

Physical Examination. A small, thin woman, appearing to be about 45 years of age (actual age 37). Aside from the absence of teeth and the operation scars, the general examination is negative. **Neuromuscular system:** The pupils are round, regular, equal and react to light and accommodation, but do not hold very well. Extraocular movements well performed, no palsies or facial muscles, tongue protrudes medially without tremor. Uvula is raised symmetrically. Biceps and triceps and supinator reflexes are present and brisk. Patellar and Achilles reflexes are equal on the two sides and brisk. Abdominal skin reflexes not obtained. Plantar reflex active and flexor in type. No Babinski, Gordon or Oppenheim. No tremors.

Wassermann reaction serum positive. Examination of spinal fluid: clear, globulin +++++ albumen +++++; cells, 130 per c.mm.; small lymphocytes, 79.9%; large lymphocytes, 14.1%; polymorphonuclear leucocytes, 4.6%; plasma cells, 0.7%; endothelial cell 0.7%. Wassermann reaction positive. Gold sol reaction, 55555522±—.

Mental Examination. On admission patient

showed great psychomotor activity, was very playful, marked flight of ideas, was expansive, very emotional, very erotic. She slept very little, appetite was poor and she lost weight rapidly. Orientation and memory intact. No hallucinations elicited. In about 3 weeks improvement began and at the end of eight weeks she appeared practically recovered. On April 9, 1915, that is, 13 weeks after admission, she was allowed home on visit. On leaving, she appeared normal in every way. There was no evidence of psychotic symptoms, she had good insight, and physically there was absolutely nothing of a neurological nature that was abnormal.

This case, with the history of a previous depression and its clinical picture during the acute stage, and its recovery, is certainly in every respect typical of manic-depressive insanity, and only the positive result of the six tests causes us to put it in the group of general paresis. Only the further course will shed any light as to the correct significance of these findings, and even then we shall not be too sure that we had not been dealing with a manic-depressive psychosis, in a latent neurosyphilitic. We would strongly emphasize the point that at the present time this patient presents no mental or physical signs of cerebrospinal syphilis or general paresis, but the six tests are still positive. This case differs from the ordinary general paresis remission in that there is not a single physical sign of paresis present.

There are many transitional cases between the cases described above, showing no symptoms or signs of neurosyphilis except the laboratory tests, and the typical case of general paresis. Thus we have cases with slight character change and no physical signs except rare "seizures." On the other hand, in many cases the presence of abnormal neurological phenomena without definite mental signs is first noted. Certain remitted cases show only some slight pupillary or reflex abnormality. We believe we have here added the last link in the chain between the primary and quaternary symptoms.

SUMMARY.

1. There is a group of cases showing the laboratory signs characteristic of central nervous system syphilis: (a) positive Wassermann reaction in the serum, (b) positive Wassermann reaction in the spinal fluid, (c) pleocytosis, (d) excess of globulin, and (e) of albumin in the spinal fluid, (f) gold sol reaction of central nervous system syphilis, and which show no sign or symptom of neural syphilis.

2. We believe these cases represent a form of chronic cerebrospinal syphilis, probably parietic in type.

3. They have the greatest theoretical and practical significance in the consideration of the life history of neural syphilis, on the concepts of allergie, in regard to results of treatment, and finally as to the evaluation of the laboratory tests.

4. Here is offered the last link to form a complete chain between the symptoms of the primary stage of syphilis and its final termination of life as the result of the diseases cerebrospinal syphilis or general paresis.

(Series to be continued.)

Therapeutic and Preventive Medicine

THE TREATMENT OF HEADACHE.

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As a general principle in the treatment of headaches, the greatest care must be taken in making a diagnosis, since a number of different diseases have headache as a symptom which only disappears when the disease in question has undergone its specific therapy. Such is the case in headaches secondary to cerebral tumors, brain abscesses, hydrocephalia, cerebral and cerebrospinal syphilis, progressive general paralysis, circulatory disorders due to heart and pulmonary affections, nephritis, infectious diseases, acute and chronic intoxications, constitutional and secondary anemias, diabetes, and to uric acid arthritis.

In cerebral arterio-sclerosis, the patient's mode of life should be carefully arranged so as to prevent an aggravation of the secondary headaches. Work should be limited or even stopped entirely. Tobacco and alcohol are to be forbidden and everything that can increase blood pressure, especially physical and intellectual effort, sexual excesses and excitement of any kind. Warm foot baths and poultices to the nape of the neck and to the sternum are indicated. Daily and regular stools are necessary, with the aid of a purgative if required. The meat diet should be limited and there should be sufficient sleep. Iodine may be administered in small doses continued for a long period. (Iodide of potassium, (10 to 15 grams, to a two-one hundred solution,) one tablespoonful morning and evening). Or tablets of sajodine at 0 gr. 5 or iodval at 0 gr. 3, may be prescribed three times daily. A combination of sodium bromide, gr. 20 and potassium iodide, gr. 10 in distilled water, is found effectual when taken three to four times daily for four to six weeks. If the pain is unusually severe, antipyrine, phenacetin or pyramidon may be used. Cold applications and ice-bags to the temples also give relief. For some patients, a stay at a high altitude or on the sea shore is to be recommended. For plethoric patients laxative cures at springs like Kissingen, Marienbad and Homburg are indicated. In cases of disseminated sclerosis of the brain and of the spinal marrow, the headaches disappear after three

or four weeks of mercurial treatment. In diseases of the eye when the patient has passed fifty, the headache symptom points to glaucoma and the physician should proceed accordingly. Sun-stroke headache is best treated by a rapid infusion of water by mouth, rectum or subcutaneously. The headaches of hysteria (clavus hystericus) may be dispelled by suggestion either when the patient is in the hypnotic or in the waking state. In gastro-intestinal disorders, particular care should be directed to constipation, as the headaches are frequently caused by violent efforts of the patient at the stools.

Cornu used bromide of potassium in his chronic migraine cases in epileptic and delirious patients. Windscheid has had most success with bromine, and when rheumatism is present, he also recommends active massage. Edinger's unqualified endorsement of massage as a treatment for chronic migraine is due to chronic myositis in the cranial insertion of the muscles of the neck, the splenius, sterno-cleido-mastoid, trapezius, etc.,—and sometimes on a level with the insertion of the temporal muscle. The limited deposits of muscular inflammation were speedily improved by massage in 14 cases reported by Norstrom. Auerbach states that the prophylaxis for migraine is that for diseases of the brain in general—open air life, avoidance of emotion and mental over-exertion, well-regulated hygiene of daily life and absolute abstinence from alcohol. Members of migraine families should interchange activity and rest and not take too great intervals between meals. A biscuit with a glass of milk or a roll would suffice. A too exclusive meat diet should not be permitted. A prolonged stay at the sea or in the mountains may be of benefit, but not less than four weeks.

As for the medical treatment of chronic migraine, the milder forms require none. For the severer forms, the bromides attack the disease itself and combat an increase in the attacks. Auerbach prefers the bromide of soda with a salt-free diet if the action is to be intensified. This bromide cure was recommended by Livinge and by Charcot, and should be repeated several times in the year. Moebius recommended 15-30 grs. of sodium salicylate, antipyrin, 5-15 grs., phenacetin, 10-15 grs., migrainin, 15 grs., pyramidon, 5-7½ grs., and aspirin, 15 grs., may also be tried in a cup of strong coffee with one or two biscuits. For the severest forms, only an injection of morphia (¼-½ gr.) is a certain remedy. Absolute rest in a darkened room and a cold wet compress or ice bag on the head should accompany the above mentioned anti-neuralgics.

In neurasthenic headache, the physician has to consider the fact that the most important factor of nervous debility is heredity, and he should warn every constitutionally neurasthenic person of the important danger for his descendants. Dietetic treatment should tend to combat the bad habits acquired in the mode of life, such

as tobacco, alcohol. If the provocative causes of neurasthenia are to be sought elsewhere, a pint of beer in the evening and ½ cigar may be allowed. Sexual excesses, especially onanism, must be strictly forbidden. With married people, the physician must inquire as to the frequency of marital relations, and whether they are abnormal, interrupted coitus, etc. The treatment for migraine as to intervals of food and rest also applies to neurasthenic headaches. Electrotherapy (galvanization of the head and the neck) is also effectual. Bromine should be used (2 to 3 grs. *pro die* for 3-4 weeks). In grave recalcitrant forms, the patient should be sent to a sanatorium for prolonged treatment, where an isolated room and meals are frequently required. Ziemssen's project of pavilions for the cure of neurasthenia should be carried out for the public hospitals, as some of the severest cases of neurasthenic headaches are amongst the poor.

Nodular or rheumatic headaches may be most effectually combated by manual massage, and the utmost precaution should be taken against chills and abstinence from alcohol strictly enjoined. The head should be raised when sleeping to avoid hyperaemia and women should not wash their hair during the attacks. Afterwards shampoos with spiritous liquids may be permitted. The massage sittings should occur daily for fifteen to twenty-five minutes, during which the chin should be supported by the masseur's hand on the table and the patient should comfortably recline on a chair with a not too high back. Every sitting should be preceded by application of hot poultices (linseed meal or thermophores) to resolve the affected spots on the scalp and in the muscles. If the infiltrations are large and hard, an ichthyol ointment (20%) may be employed. Experiments with radium emanations have recently been recommended for gout and muscular rheumatism.

Auerbach gives the following details as to the massage technic which may be carried out by the physician if the masseur is not especially efficient. One should begin with forcible stroking (effleurance) of both lateral aspects of the neck, from the mastoid process to the acromion, carried out with the flat of the hand. The middle of the occiput and the nape of the neck are then treated in the same way with the right hand (10 times). This action serves to empty all the centripetal lymph vessels. The hair may so far be left undisturbed. For later manipulations the necessary regions must be exposed by parting the hair or throwing it forward in case there should be heavy masses of hair, supporting it on the arm used for massage.

Next follows a thorough kneading (petrissage) of the muscles and of the skin: First, of the left lateral occipital and cervical region as far as the shoulder, then of the central and finally of the right regions. This should be performed with both hands, opposing the other vertically to the course of the muscles to be massaged. The mas-

seur must endeavor as far as possible to raise deeper muscles from their supports and to get them between his fingers. Each kneading should be carried out five times and be followed by vigorous stroking. This stroking should be directed along the whole circumference of the occiput from one mastoid process to the other, to the insertions of the muscles of the neck and of the back of the neck. The stroking should be performed either with the thumbs or the closely approximated tips of the other fingers in a centripetal direction (*i.e.* towards the neck) downwards into the muscular bellies (twice from left to right and twice the reverse way). The individual sub-cutaneous and intramuscular indurations should then be sought out and stroked separately. This movement of simultaneous friction and percussion is best carried out by means of the tips of the three or four fingers closely approximated in such a manner that the wrist remains stiff and the actual movement becomes one of rotation through a small circle from the shoulder. One must constantly keep in view the end aimed at, *viz.*, to disintegrate the nodules and the indurations. Each nodule should be manipulated not longer than half a minute, ending with *effleurage* directed according to the topographical position of the individual nodules.

Next, one should place both hands simultaneously on each side of the sagittal suture and carry out a movement of *effleurage*, using some force, pressing through the scalp and temporal muscles on to the skull and finishing close behind the auricles (6 to 8 times). The indurations situated in the area thus marked out are then sought out and the massage is applied as above described. If the temporal muscle itself is affected, it must be thoroughly treated by *effleurage* in the direction of its fibres, (toward the coronoid process of the lower jaw) and then by petrissage. After the manipulations there should follow a stroking of the occipitofrontalis in its entire breadth, from its tendinous insertion to the eyebrows, with the approximated finger-tips (6 or 8 times). Any possible nodules in this region are rubbed as above described.

Finally one should proceed to the *effleurage* of the skin and forehead and the side of the face, using the palms or surfaces of the fingers, those of the left hand on the right side of the forehead and those of the right hand on the left side, so that the tips of the fingers on each side meet, stroking downward to the bones of the face, pressing through the soft parts of the forehead, proceeding backward to the temples and cheeks and using firm pressure, more and more of the whole hand. When the angle of the jaw is reached, the head is so turned that the thumbs on each side press into the region in front of and internal to the sterno-mastoid where the great blood-vessels and the nerves are, and then carry out firm but not too deep *effleurage* over the great blood-vessels and the lymphatics in a centripetal direction. After the

massage the patient should rest for half an hour to one hour, lying down if it is possible.

In Prof. Edinger's prefatory remarks to Prof. Norstrom's book on chronic headaches he regrets that Norstrom, Henschen, Helleday and the other Swedish authorities on the massage treatment are not sufficiently known. But since the translation of Prof. Norstrom's book into English (New York, 1902) we have nothing to complain of on that score. It is to be regretted that the same author's "*Traité Théorique Et Pratique Du Massage*," Paris, 1891, and his "*Céphalalgie Et Massage*," Paris, 1890, have not yet been placed within the reach of the practitioners whose college French has become somewhat rusty.

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Medical Progress.

NINTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.*

By HARRY C. LOW, M.D.; ROBERT SOUTTER, M.D.;
 C. HERMANN BUCHOLZ, M.D.; MURRAY S. PANKFORTH, M.D.; AND ROBERT B. OSGOOD, M.D.,
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TUBERCULOSIS.

At the present time the discussion of the cause, exact site of origin and form of treatment in tubercular coxitis is as acute as ever.

Ridlon¹ in a recent summary of this subject discourages any routine method of treatment and emphasizes the importance of accurate diagnosis. It is his experience that the selection of appropriate methods of treatment must be determined by the individual characteristics of the case. He has never seen any good come from an open operation in tuberculosis of the hip, and he cannot too strongly condemn the tendency of some surgeons to try to eradicate the disease process. Surgical interference is contra-indicated.

Fraser in his recent book² and other writings³ has more definitely shown the importance of the bovine type of tubercle bacillus in joint disease. In a long series of cases, 62% were due to the bovine bacillus and a probable milk-borne infection. Of the 38% human cases, nearly three-fourths gave a family history of tuberculosis. Here is clearly shown the importance of the present activity in the study of social conditions in their relation to tuberculosis of the bone and an urgent argument for the isolation of pulmonary tuberculosis. He also maintains that the resistance of bone marrow in the healthy bone

* This report is based on a review of 483 articles selected from about six hundred titles having to do with orthopaedic surgery appearing between August, 1914, and January, 1916. References are given to only such articles as have been considered for notes and comment.

is great enough to prevent infection. Joints are readily infected through the blood stream, the anastomosis of the circulus vascularis in the fringes of the synovial membrane is the exact place where disease usually begins in previously healthy tissue.

All treatment must be based on diagnosis, and the development of the Wassermann reaction has shown us the probable reason why so many supposedly tubercular cases were benefited by the iodides. Mariano Salaghi¹ believes in the importance of iodine as an adjunct in the treatment of bone tuberculosis.

(ED. NOTE: The general tonic virtues of iodine are long established, but in the light of these cases showing the Wassermann reaction and atypical x-ray lesions the improvement from the iodine treatment is undoubtedly further evidence that the lesion is that of lues. Luetic bone disease is being recognized by us as much more prevalent than was formerly supposed.)

Ivashenzoff and Lange² have reported good results from the use of salvarsan in bone syphilis.

Not only must we learn to recognize the value of the Wassermann reaction in diagnosis, but we must not forget the tuberculin test. Keppler and Erkes³ insist upon the value of subcutaneous injection of 1-10 to one milligram of tuberculin in every doubtful hip case. The marked local reaction, coming on in six to twelve hours, and lasting for a day or two in tubercular cases is always noticed. The negative findings are of only a little less value.

The great importance of the thorough study of etiological factors is further shown by Osgood⁴ in calling our attention to an apparent relationship between faulty posture and of intestinal derangements and coxitis. He expresses the definite conviction that a joint never recovers complete range of motion and perfect function in which the clinical signs over a considerable period of time were typical of tuberculosis and in which the clinical diagnosis was confirmed by tuberculin reactions, roentgenoscopy or by exploratory operation and pathological examination. He believes that complete cure of tuberculous disease, especially in the hip, does not occur. His conviction is strengthened by the cases he reports, which presented the typical picture of tuberculosis, but have made complete recovery under simple postural and general treatment. All showed normal x-ray pictures and negative von Pirquet reactions. A careful search should be made in similar cases for a possible cause of toxæmia.

(ED. NOTE: While it may be impossible to disprove Osgood's rather exacting requirements, it is still the equally firm conviction of men of wider experience that mild cases of tubercular coxitis may completely recover.)

Lapinsky⁵ reports five cases and reviews eighty others in which there was pain and swelling in either knee or hip accompanying diseased processes in the viscera. The joints showed no pathological bone lesions, though there was swelling of the soft parts, fluid in the joints, and crepitus. As a proof of the correctness of the reasoning, the treatment directed toward the cure of the accompanying visceral disease was much more effective in relieving the joint conditions.

HELIO THERAPY.

In those climates where the sun's rays are less favorable for the application of heliotherapy, there

is much to recommend the use of Vignard's lamp. Pigmentation is as good and much more quickly obtained than by the sun's rays and there seems to be no more danger in its use. C. Martin-du Pan⁶ has tried various artificial lights for the treatment of bone and joint diseases, but discarded the arc light, as it generates too much heat. The quartz mercury lamps send out rays most closely approximating direct sunlight, but the middle ultraviolet rays act on the skin, and although useful for lupus and other superficial lesions, they are not only useless, but injurious in treating deep lesions. They can be filtered out by interposing a sheet of "pastel" glass, white on the cut edge, which sifts out these middle ultraviolet rays. With a lamp constructed on this principle, with air passing out through a chimney at the top, the skin exposed to its light never gets warmer than 40° C. (104° F.) and there is no perspiration to debilitate the patient and make him thirsty. The lamp has 7,000 candle power and is run with a 500 volt current obtained from the street railway system. Four or five children are exposed to the light at a time. They lie on a large table which slopes down toward the centre. Each wears goggles to protect the eyes, but no clothes, the aim being to imitate as closely as possible with artificial light Rollier's method of exposure to the direct sunlight in the Swiss mountains. The result in the 32 cases thus treated has been extremely encouraging. They include tuberculous processes in the knee, spine, hip joints, etc., osteomyelitis, and two cases of chronic peritonitis. (One girl of six had been operated on two years before for an extremely painful tuberculous process in one knee. She later developed tuberculous keratitis and the other knee became swollen and painful. She was then given a course of the artificial heliotherapy and there was no further pain after ten exposures. By the end of three months the knee was apparently normal and the child had gained 900 gm. in weight.)

There is much to be gained in the treatment of tuberculous patients by taking an optimistic point of view; the pessimist has a hard time fighting tuberculosis, and Rollier⁷ in his delightful book, "Le Cur de Soleil," does show what the sun and air can do. His cured cases of very extensive tuberculous bone disease are convincing. All he does is to apply sunlight directly to the skin of the whole body and have the patients maintain such rest as may be indicated by the extent and character of their disease. We should avail ourselves of his methods in the treatment of our patients as far as climate and local habits will allow.

Those who have seen cases improved under treatment with the sun's rays at the seashore are reluctant to acknowledge that the advantages of altitude are as great as are claimed. Andreae⁸ has had very favorable results in using these therapeutic measures in the low-lying countries, and gives us encouragement to accept every help available in the treatment of bone tuberculosis and chronic osteomyelitis.

A. Martin⁹ states that he knows of no instance of a tuberculous process in the clavicle of a child. The majority of those affected are, however, fairly young adults and have a history of tuberculous glandular process or otorrhea. In one case the process occurred in the clavicle of a young man with inherited syphilis. None of the patients had certain pulmonary tuberculosis, but were regarded as "suspects." Four cases are illustrated, showing that either end of the shaft may be involved. If

the latter, the findings are similar to those of spinaventosa in other bones.

ARTHRITIS.

The presence of a chronic focal infection is now presupposed in almost all persistent cases of arthritis and the first step in treatment is a search for its source.

Rosenow¹³ says "the focus of infection is to be looked upon not only as the place of entrance of the bacteria, but also as the place where the organisms acquire the peculiar property necessary to infect." The poor results from autogenous vaccine may be due to the fact that the bacteria present in the focus at the particular time the culture is made, are not the same as those infecting the tissues.

Nicoll¹⁴ used in cases of chronic arthritis a polyvalent horse serum from 25-30 strains of streptococci isolated from enucleated tonsils or the joint fluids of arthritic patients. He concludes that the use of antistreptococcus serum in the treatment of chronic arthritis is neither advisable nor justifiable.

(ED. NOTE: The infected crypt of a tonsil may be easily detected, but the sealed cavity at the root of a tooth often serves for years as a source of infection without showing any local signs that may lead to its detection. The only way in which some of these cavities may be detected is by radiograms of the jaws, and to be satisfactory, these should be made on small films. The physician should make it a part of his duty to see that proper dental treatment is carried out.)

Gara¹⁵ in a review of chronic joint affections resulting from metabolic disturbances, has encountered a special group of cases of chronic joint disease accompanied by various symptoms suggesting neurasthenia and disturbance in the genital sphere, besides the rheumatic joint affection. Closer study of this group of cases during the last three years has shown that the thyroid is always more or less enlarged. Discovery of this suggested that abnormal functioning on the part of the thyroid might affect the functioning of the ovaries. This assumption explained at once all the different symptoms observed, from the nervous palpitations and restlessness to the amenorrhea or dysmenorrhea, all of which had proven refractory to ordinary measures. The evidence which Gara presents makes a good plea on behalf of the thyroid origin and necessity for treatment on this basis in a certain portion of cases of chronic articular rheumatism. He has encountered 132 cases of the kind, all but eleven in women from 16 upward; forty-three were over 45. This thyroid group formed about 20% of his cases of chronic rheumatism of the joints.

(ED. NOTE: He practises at a spa, and consequently sees the patients only while they are taking the waters, so he has no opportunity to apply continuous treatment on the premises. He urges general practitioners to be on the lookout for such cases and to give them systematic thyroid treatment on the above basis.)

Schwarz¹⁶ in the military sanatorium of Teplitz-Schonau, has treated during the last eight years 6232 cases of articular affections. Most cases had gonorrheic arthritis, a number septic metastatic affections and some traumatic arthritis. He reports particularly the good effects of the baths upon the absorption of exudates. In cases of contractures, medico-mechanical treatment is used in connection with the bath.

Gillette¹⁷ calls attention to the injurious effects of forcible passive motion in diseased and traumatic joints. This is a very timely paper, in which the author makes a plea for the protection of and later active motion only to the point of pain in inflamed joints, instead of the forced passive motion either with or without anesthetic, which is too commonly practiced.

In a long paper Axhausen¹⁸ discusses the causes of the early cases of deforming arthritis of the knee. He believes injury to the cartilage is a most frequent stimulus to formation of loose bodies. Recurrent pain and swelling in any traumatic knee joint is sufficient reason for arthrotomy and removal of loose and pediculated bodies or folds of capsule.

(ED. NOTE: The results of arthrotomies in tuberculous and other stiff knees bear us out in advocating the exploratory arthrotomy and removal of obviously foreign bodies in a greater percentage of these persistent cases.)

There is a form of ankylosis of the spine that in its rapid course and our lack of knowledge of its cause or treatment is very discouraging. Turner¹⁹ reviews the literature of the Bechterew and Strümpell-Marie types and concludes that Bechterew may be wrong in some statements and that the ankylosis of the spine which he describes is simply a form of arthritis deformans, and that the cause will be found in some focal or specific infection. There are, however, many cases carefully reported by Strümpell, Hoene, and a host of others that show absolutely no source of infection. It is evident that we must recognize a difference between the Strümpell-Marie and Bechterew types clinically and pathologically.

Fraenkel²⁰ describes pathological specimens that represent a difference between spondylitis ankylopoetica and spondylitis deformans. The former is ulcerative arthritis, a joint disease, where the ankylosis takes place in the small articulations of the spine, while the ligaments are not involved. In spondylitis deformans (Bechterew's) the stiffening occurs through ossification of the several intervertebral discs and ligaments and the growth of marginal exostoses. Clinically in this latter type it is unusual to find the spine ankylosed in its entire length, while this is the rule in the ankylopoetica type. The radiograph will differentiate these types and this is fortunate, because the prognosis is favorable in the ligamentous form and unfavorable in the true Strümpell-Marie type.

POLIOMYELITIS.

From Sever's²¹ very adequate review of the recent literature on poliomyelitis one may draw his own conclusions. It is essentially an epidemic disease, Korczynski²² showing that with the same infection various types occur according to the particular site of the attack. Any one of Wickmann's eight types may be represented.

(ED. NOTE: Variations in the wide spread systemic lesions of the viscera now recognized as occurring in this infection may account for all grades from the atypical or abortive cases to those appalling fatal ones.)

The unusual sporadic cases with atypical course and symptoms can be matched by some of the cases occurring in or at the end of epidemics, and with his conclusion we agree that both sporadic and epidemic cases are absolutely the same disease.)

Flexner and Amoss²³ report experiments which

show that usually the virus of epidemic poliomyelitis enters through the upper respiratory mucous membrane to the olfactory lobes and is distributed by the cerebro-spinal fluid.

Lenoble²⁴ has encountered six cases of familial paralysis in two families and in these alone in the ten years of practice in Bretagne. There is evidently some organic lesion of the anterior horns of a certain segment of the lumbar cord and nerve roots. He knows of nothing on record that compares with it, except what is called familial spasmodic dorsal tabes. The segment involved seems to undergo a senile degeneration, presumably from over-use. The paralysis of the extensor muscles comes on suddenly, in one leg at a time with formication and sense of coldness. First one and then the other leg may be attacked, and the paralysis or impotence of the leg may be more or less pronounced, but it passes off in a few weeks or months. The mildness of the phenomena and the pains in the legs are special features of the syndrome. The first attack came on at 25, 28 and 32 in one family, and at 18, 20 and 24 in the other; all of the patients were otherwise robust.

(ED. NOTE: The selective lesions and mild course of the symptoms are suggestive of some of the abortive cases of poliomyelitis, but remembering the familial type, careful study will differentiate them. Taken alone one of these cases might well be confused with anterior poliomyelitis.)

In the treatment of deformities following infantile paralysis, Schouffler²⁵ makes an earnest plea for the use of splints in the prevention of contractures. The general plan is first to restore the limb to its normal position and hold it in place during the early stages, when recovery of the muscles may be expected. Many muscles apparently in complete paralysis are merely suffering from over-stretching, and when protected for a sufficiently long time, regain a great deal of their power. He also reminds us that too much massage as usually applied, and especially too much electricity, may injure rather than aid the weak muscles by over-stimulation. No case of deformity following infantile paralysis is so bad that there is no opportunity for improvement, and almost all cases can be put upon their feet and taught to walk, but it is also true that there is rarely a case so mild that it can be considered permanently cured and allowed to pass out of observation.

Celluloid has been much used as a light material for adaptable splints, and Batten²⁶ has treated in this way 24 out of 58 cases of acute poliomyelitis which were in his ward during the years 1912 and 1913. His method of making the splints does not differ essentially from the ordinary, but he insists on their early use. In cases seen within four weeks of the onset splints should be worn day and night and removed only for bathing and exercises. After one month it is often possible to get the patient into an erect position and attempt walking. Any apparatus fit to hold the lower limb in a position for walking is of the greatest assistance in properly developing the muscles. In the same way, he uses splints for the upper limbs to prevent deformity. Of the 24 cases thus treated 21 are known to have had no mal-position or contractures.

(ED. NOTE: The cases studied were almost all of the acute type, in a certain percentage of which a good recovery takes place without careful treatment. His results in regard to subsequent deformity are more satisfactory than one would expect, but

probably many of them with several years of static strain will show the deformities characteristic of the paralyzed foot. The lightness of the celluloid splints is perhaps their most favorable feature. While apparatus may, as the writer states, help muscles to regain their power, heavy apparatus also adds burden which fatigues rather than strengthens, which supports, but does not stimulate.)

Spitz²⁷ says that plastic operations for residual paralysis in these cases must be chosen to fit the existing conditions, and exemplifies the need of transposition of tendons for support rather than for muscle action. By this means and well considered arthrodesis, functional static results may be obtained.

Nerve grafting has rarely been successful in these cases and it is important to note the result obtained by Katzenstein²⁸. Almost complete paralysis of the arm was greatly relieved by grafting the healthy supra-scapular nerve into the cervical plexus on the paralyzed side. The close proximity of the large vessels and the esophagus make this an operation of much seriousness. He has done a similar operation with the obturator nerve in leg cases.

(ED. NOTE: The field of nerve surgery opened up by such operations as those of Foerster and Stöfel is as yet a *terra incognita*. There have been brilliant results, the possibilities are theoretically good, but as yet the chief encouragement is that they are still possibilities.)

SCIATICA.

Severe incapacitating pain along the course of the sciatic nerve is common and often difficult of treatment,—a baffling complaint it may well be called. Its chronic course has led to the use of various methods to find the means of cure in each case. Doubtless in intractable cases such as Nannini²⁹ reports, he is justified in exposing the sciatic nerve and making strong traction in both directions to break up the adhesions which he always finds present. After a few days of pain and paresthesia the leg was freely used in two weeks and the cures were complete and permanent, though it would seem that this operation for relief would not remove the cause and chance of subsequent attacks.

Autogenous vaccines and especially the gonococcus (Zapffe³⁰) have been used often without sufficient clinical justification and some of the cases have been relieved.

Lethaus³¹ thinks the use of alcohol to block a nerve with both sensory and motor fibres is a dangerous procedure. He injects 100 c. c. of a one per thousand solution of a mild anesthetic at the point where the sciatic nerve emerges from the great sciatic foramen, between the trochanter and the tuberosity of the ischium. Three or four injections into or about the nerve may be given once a week. In some cases both these and intradural injections fail and he recognizes that this form of treatment does not attack the causes and lays special emphasis on the necessity of eliminating every possible postural or inflammatory defect in the foot, leg or pelvis.

Heile³² discusses the preferable technic for operative relief of pain from pressure or traction on the sciatic nerve, after failure of internal measures. He has found acute sciatica, especially sciatica developing after an accident, much easier to cure than moderate sciatica in patients with a familial tendency to rheumatism. When severe sciatica per-

sists unmodified by persevering internal treatment, he injects 100 to 200 c. c. salt solution directly into the nerve. This loosens up the fibres and may break up adhesions that have formed between the fibres and the sheath of the nerve. He makes the injection just as the nerve emerges from the sacro-sciatic foramen, at the centre of a line drawn from the superior posterior spine to the tuberosity of the ischium. In four exceptionally severe cases of years' standing in which no measures had given any but transient relief, he cured the sciatica at one stroke by the following operation, the interval since being fifteen months: He exposed the nerve where it pierced the pelvis, opened the outer sheath, and separated a network of adhesions inside. He ran his finger into the foramen to learn if there was any pressure on the nerve beyond and found it necessary in one case to excise the arteria comitans and the piriform muscle, as they seemed to press on the nerve. He concluded by injecting salt solution into the nerve beyond the point he could reach. The nerve thus carefully isolated was buried between the fibres of the gluteal muscle, drawn apart for the purpose. The results in these desperately chronic and agonizing cases were so surprising that he does not wait for further confirmation to publish the method. When a preliminary injection relieved pain, even temporarily, this indicated that mechanical factors were involved, and the case seemed promising for permanent operative relief in this way. The same principle can be applied to other nerves. There were never any symptoms suggesting impairment of function of any fibres of the nerve after ward.

From these deep injections it is but a step to Stoffel's²² more exact and scientific operative procedure, the resection of 15-20 cm. of the affected branch of the sciatic nerve. Stoffel's first reported case was a chronic condition due to a sudden catch when lifting a heavy weight four years previously.

The mechanical and postural causes must be remembered, and Forbes²³ further believes sciatic pains are in the majority of cases due to the rheumatoid diseases, as classified by Goldthwait, especially the hypertrophic or chronic infectious type. Thus he thinks that in 90% of the cases general and local treatment of hypertrophic arthritis will give relief.

(ED. NOTE: In recognition of the large number of cases of sciatic pains and scoliosis that occur in young and apparently healthy men due to sudden strain in lifting, which we find in our clinics, cases which show no bony hypertrophic changes, we have believed that the element of strain or partial subluxation with lesion of the muscles, fascia, and ligaments was by far the most important first cause, though hypertrophic changes may also be an added factor in some of the post-adult cases. A rheumatoid condition, one of unbalanced metabolism and assimilation may be a concomitant factor in chronic and persistent cases.)

These convictions are in keeping with the opinion of Bucholz²⁴, who in a second report of his extensive studies of sciatic scoliosis shows the undoubted relation of an anatomical lesion in sciatic pains. Out of 88 cases, 32 were due to a definite single trauma; 3 to infections in addition; 24 to occupational trauma; 7 showed no cause but hypertrophic arthritis. He describes very carefully the symptoms and remarks that the x-ray pictures, though important, unfortunately have not always helped much in making pathological diagnoses.

CONGENITAL DEFORMITIES.

Club Foot.

The correction and prevention of deformity in club foot is largely a matter of patient attention to the details of the particular treatment chosen. Schapp's²⁵ realizes the need of early treatment, the importance of well controlled growth in determining the shape of the foot and the need of some healthy exercise rather than continuous fixation. Instead of retention in plaster he uses an ingenious device consisting of a leather band, shaped like a cone, placed around the dorsally flexed foot and leg, with the heel at the apex. A steel sole plate and lacing at the side and between the leg and at the top of the foot keep it from twisting off. Such an apparatus can be made to hold the foot in over-corrected position and be easily removed for massage.

Lamy²⁶ in fourteen cases from two to ten months old, treated by Menciére's method, reports excellent results. By means of an osteotome and two small spoons, the astragalus is entered anterior to the fibula and the interior of the bone scooped out, allowing perfect over-correction of the deformity.

Congenital Dislocation of Hip.

The importance of attention to developing the details both of the treatment and after-treatment is well exemplified in the satisfactory results now shown in congenital dislocation of the hip.

Gaugele²⁷, who claims a successful result in every case of children under seven, believes his method of after-treatment is the most important factor. The first position in plaster is 90° abduction, 90° flexion, no rotation; changed in five weeks to 80-85° abduction, 90° flexion, 20° internal rotation. After fifteen weeks he holds the leg in his special brace (a complicated piece of apparatus, efficient, but evidently needing the special care that he lays stress upon). The brace, while allowing flexion and extension, limits the adduction and internal rotation. The position is gradually allowed to become more nearly normal during the eight to ten months that the brace is worn.

Mayer²⁸ reports twenty-five cases completely cured. In the last five years he reports 95% of anatomical cures, as compared to 40% in 1907. Though he uses extension for two weeks before operation in the older cases, he thinks that in young children it does harm by overstretching the adductors. His long after-treatment is followed up in plasters immobilizing both thighs and including the foot on the affected side. Later he uses his modification of the Hoffmann apparatus.

Bradford,²⁹ in reviewing the results obtained at the Boston Children's Hospital during the last 30 years, says that the percentage of cures has increased from the early failures to 90% of the single and 55% of the double. His own efficient apparatus for fixing the pelvis, producing extension, and exerting pressure on the greater trochanter is well known, and with this aid to mechanical efficiency he feels that it is necessary in occasional cases only to divide the contracted tissue, reduce the dislocation, and stitch the capsule closely about the neck.

Lexer³⁰ in extreme cases of congenital dislocation now advocates removing the entire capsule, boring a deep acetabulum, forming a new head to correspond, and surrounding the head before placing it in a new acetabulum with a free transplanted fat flap. He reports the case of a nineteen year old patient operated on in this way, and seven weeks later patient could walk a few steps without use of a cane and with firm, free movement in the hip

joint. In certain cases he has resected the head and nailed it to the ilium as a projecting lip, securing a firm fixation for the head and allowing a pseudarthrosis to develop between it and the rest of the femur. He says that the limp disappears and fairly good motion and support are present. He formerly had some good results in the cases where he formed a bony ridge on the upper edge of the acetabulum by nailing on a piece of free transplanted bone.

(ED. NOTE: By this latter operation we have observed a very satisfactory result in one case operated upon by Brackett, where there was almost entire absence of the acetabulum and a much deformed neck of the femur, allowing considerable subluxation. The operation of forming a new acetabulum when it is possible and there is not much deformity of the neck of the femur has still a great disadvantage in that it may not result in a freely movable joint. The chances of stability in this method of nailing the head of the femur to the ilium are, on the other hand, of great advantage.)

DISLOCATIONS.

Though the symptoms of "snapping hip joint" may not often be severe, their persistence is sufficient to bring many of these cases for relief. They seem to be divided into types.

Coudray⁴ describes the true snapping joint in which there is transient or intermittent subluxation of the head of the femur outside of the acetabulum, and a more common false type in which the click is caused by the slipping of a fold of fascia over the trochanter.

Bertein⁵ thinks these trigger joints are due to a laxity of the capsule, often congenital. These are not reducible dislocations, but are voluntary subluxations of the joint controlled by muscle contraction. They reduce spontaneously, and the relaxation may be indefinitely repeated. The treatment is very unsatisfactory, though Müeller⁶ reports a cure in four months by the use of a steel spring band on the corset pressing just behind the trochanters. The false type of muscle or fascial bands may be cured in this manner or by excision.

More attention should be paid to the diagnosis of dislocations of the cervical spine. They do occur more often than is suspected and the diagnosis will generally be made from the x-ray. The case of rotary dislocation of the atlas complicated with aphonia reported by Morton⁷ is especially interesting on account of the presence of an accessory cervical vertebra. The dislocation was caused by a twist of the neck in wrestling. The head was bent to the left shoulder and speech and swallowing were difficult. Under ether a normal position was obtained by extension and rotation, and recovery in plaster was rapid. Abnormalities should be considered in all lesions of the cervical or lumbar spine.

Subluxations of the atlas upon the axis are reported in several cases by Ogilvie⁸ and Griffith⁹. The former especially remarks that an unguarded, sudden jolt with direct blow may often be the cause and that the condition may not be suspected because the pressure symptoms often do not at once occur and are slight or entirely absent. Fractures occur in the majority of cases, and immediate reduction and fixation in plaster-of-Paris should be made. Subsequent distressing symptoms may necessitate operation. He classifies them in three types: the simple forward displacement, the flexion cases with horizontal and vertical malposition, and

those with rotation around the axis on the same plane. Griffith emphasizes the fact that only through the mouth can a picture of the odontoid occipito-atloid and atlo-axial articulation be obtained. He believes in Walton's method of reduction in cases of unilateral subluxation.

Habitual dislocation of the patella is an orthopaedic condition more easily diagnosed but less satisfactorily remedied. Lorenz¹⁰ says that it is due to laxity of the joint capsule and of the vastus externus fascia on the inner side of the patella, uneven action of the quadriceps, various bone abnormalities, and deformities of the joint. It should be sharply distinguished from the congenital type. He performs a simple overlapping of the capsule and fascia on the inner side of the patella in layers, following the method of von Mikulicz.

(ED. NOTE: While this method often results in a relief of the condition, recurrence is not infrequent. We believe that in most cases a realignment of the pull of the patella tendon after the method of Goldthwait¹¹ is likely to offer more permanent correction. In cases in which there is a marked deformity of the outer femoral condyle the lifting of the condyle by means of a bone graft wedge offers a still greater security. This method of the re-establishment of a good inter-condylar sulcus in which the patella may rest was devised and employed successfully by Brackett and later described by Albee.¹²)

The shoulder is another joint subject to this recurring dislocation, and Schultz¹³ gives an illustrated description of 23 cases and presents clinical and anatomic evidence to show that the accident causing the dislocation in the first place had not caused a lengthwise tear in the capsule but had torn the capsule loose from its attachment to the humerus or scapula. The retracted, jagged edges were unable to coaptate spontaneously and connective tissue grew into the gap. This answered the purpose in some cases but in others the least overstrain tore the connective tissue bridge and dislocation returned. This explanation of the causes of habitual dislocation is sustained by the frequent relapses after treatment by the most approved methods, operative or otherwise, had been applied to 26 shoulders (23 patients), as he describes in detail. One patient, a man of 60, had had the dislocation return eleven times; an injection of blood into the joint warded off recurrence for 18 months at one time. Schultz declares further that the changes in the bones, etc., are all secondary to this tearing off of the capsule from the bone. The proper treatment, he says, is to expose and examine the joint from the axilla, at the lower margin of the pectoralis. If there are no pathologic changes the capsule can be effectually closed by a suture. If the capsule stump has retracted and shrivelled, he draws it down and sutures it, thus making the capsule cavity smaller and then over the suture nails to the bone a well fitting flap of fascia. This technic has been applied to date only on the cadaver, but it proved extremely simple and the joint afterward effectually resisted all attempts to dislocate anew.

(ED. NOTE: The editors do not recommend the trial of this operation by others until Schultz has demonstrated its successful performance and subsequent permanent result in the living subject.)

JOINT SURGERY.

The knee joint from all points of view presents one of the most interesting problems in orthopaedic surgery. There the arthroplasty and other surgical measures are more apt to fail on account of the severe stress that this joint undergoes and the flat nature of the articular surfaces. Any new point of attack like that which Corner²¹ highly commends, and is to be credited to Jones of Liverpool and Smith of Winnipeg, should be mentioned. By a median incision, a longitudinal splitting of the patella and the quadriceps and the patellar ligaments, detachment of the ligamentous mucosa from the femur and separation of the alar ligaments, opportunity is given when the parts are retracted to inspect the whole joint thoroughly. The joint is closed by continuous catgut sutures.

Babitski²² also reports the very satisfactory results of this means of access to the knee joint.

(Ed. Note: This method of opening the knee joint has been used by Brackett and others in the Orthopaedic Clinic of the Massachusetts General Hospital in many cases. There has been no failure to obtain first intention healing, and free motion in the joint has been regained in a surprisingly short time (3-4 weeks). The exposure offers an excellent opportunity of inspecting the condyles of the femur and the crucial ligaments. It offers the best chance of finding and removing foreign bodies and joint mice and lipomata. The semilunar cartilages in our opinion are more easily removed by the smaller internal and external L shaped incisions of Mr. Jones nearer the joint line.

In the hip and knee joints it may be said that mobility is not to be secured at the expense of stability and careful thought should be given to the relative functional value of a stiff or mobile joint.

Vulpus²³ reports excellent results in arthroplasty. Through large bilateral incisions he carves the articulating surfaces to the desired shape with delicate files and saws and interposes large pedunculated flaps of fascia, not only covering the raw surfaces of the femur, but in the knee, under-padding the patella. One case, recently seen years after operation, shows excellent results in a hip joint which had been previously ankylosed for twenty-five years. Two cases of severe and painful ankylosis of both hips showed such excellent results as to justify operative measures for all chronic joint processes entailing ankylosis.

In ankylosis of the jaw, Blair²⁴ believes that operation offers the only relief. He reviews the literature of 199 cases and shows that, except in a few, stretching is not a permanent or an adequate relief in ankylosis of the jaw. The operation properly performed is of little risk and of great benefit. He reports 13 cases, one-fourth of which are under ten years old, in 50% of these the cause was trauma due to an early fall or blow; in 20% it was scarlatina; other cases were due to suppurative disease of the ear, teeth, etc. Development is usually gradual. In operating he removes the condyle, coracoid process, and upper part of the ramus. They are cut out with forceps, chisel and rongeur. A space of three-fourths of an inch is left and a fatty flap of the tissue is inserted between the bony edges and fastened to the internal pterygoid muscles.

(To be continued.)

Reports of Societies.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

The President, Dr. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.

THE VALUE OF VACCINES IN CERTAIN DISEASES OF THE EAR, NOSE AND THROAT.

Dr. GEORGE M. COATES of Philadelphia presented this communication, limiting his discourse to the more common uses of this form of therapy and to the cases in which one might expect success, mentioning briefly some of those in which success could not be expected. He stated that his conclusions were drawn largely from his own work and that of his friends and colleagues in Philadelphia, though he had had due regard to the reports in literature. Successful vaccine therapy of the ear, nose and throat was not so easy as it might seem. It did not consist in buying a bottle of mixed vaccines and giving hypodermics according to the label on the bottle. Some good results might thus be obtained, but there would be many sad failures. Close study must be made of the individual case and reactions observed to determine all but the first dose. A good autogenous vaccine was usually superior to any other form, but it was not to be contended that a good commercial product was not better than a poor autogenous one, and a poor commercial one was no worse than a poor autogenous one.

A stock vaccine could be kept ready for use at a moment's notice and was of value in cases in which an autogenous preparation could not be used, as for prophylaxis. For immunization against acute rhinitis where a variety of organisms was usually found, a commercial mixture of some or all of these organisms was selected, and three or four injections given at three or four days interval, the dosage depending somewhat on the individual, the sex, age, etc. Whatever the initial dose might have been it is usually doubled for each succeeding dose, unless there was too marked a local or general reaction. This should insure the ordinary person against an attack for some months but in very susceptible individuals the entire course might have to be repeated. The failures as a rule were in those particularly susceptible to colds and having one after another in close succession. Most of these had the duration of the attacks lessened and the interval between them lengthened. The treatment of acute rhinitis was exactly the same as for prophylaxis except that it is pushed a little more vigorously and continued until the trouble has been conquered. Following the first dose, and this was true of all the conditions considered, there would probably be some exacerbation of the patient's condition with increased discharge which soon cleared up in favorable cases. This reaction was regarded as a favorable omen. Chronic rhinitis was to a certain extent also influenced by bacterins, but here the treat-

ment must be extended and the patient closely watched lest he become overtreated. Suppurations of the accessory nasal sinuses were not much relieved by vaccine therapy until adequate drainage had been established. In chronic sinusitis it was usually necessary to enlarge the normal ostium or make a large artificial opening before much could be expected from the use of vaccines. In acute diseases the results were good for the most part and a stock suspension might be used in order to get quick results, at least till an autogenous one could be prepared. It would not do to give vaccines for any acute headache that seemed to be of nasal origin, the diagnosis must be established. There were certain cases of chronic sinusitis in which vaccines prepared the way for operation. Recurrent furuncle about the alae nasi and close to the alar cartilages usually caused by one of the staphylococcus group, yielded in the most satisfactory manner to vaccine treatment. Treatment was usually started in these cases by a stock suspension of staphylococcus aureus and albus, and if this was not successful an autogenous vaccine was made later. This also applied to furunculosis of the external auditory canal. In atrophic rhinitis and hay fever the vaccine treatment had not been particularly gratifying.

The treatment of diseases of the ear by bacterins had yielded surprisingly good results although some were still skeptical regarding it. Considering the close relationship between nasal and aural infections, it was only reasonable to suppose that if ear patients could be immunized against nose and throat infection one was in a better position to treat the ear disease. In chronic catarrhal deafness astonishing results could not be looked for. In cases of acute suppurative otitis media of scarlatinal origin the writer was quite sure that by the use of autogenous vaccines the duration of the disease was materially shortened and many cases were kept from drifting into the chronic class. During the past winter the author and his assistant, Dr. M. S. Erner, had made autogenous vaccines for about forty-two chronic cases of suppurative otitis media at the Pennsylvania and Polyclinic Hospitals and so far they had obtained dry ears in about 40 per cent. Their cases had been all carefully selected as having had and resisted all the usual forms of treatment and they took no account of improvements. An ear must have ceased entirely to discharge in order to be considered cured. They had also been successful in a number of instances in which the bacillus pyocyaneus was the infecting agent. Improvement in general health and resistance to other forms of infections were observed in those that responded favorably to the vaccine treatment. There were many factors that militated against the potency of a vaccine, and in nose and throat work a frequent cause of error was in taking the culture. It took a trained aurist to take an uncontaminated culture from the middle ear or naso-frontal duct. The essayist said his method was as follows:

The external canal, membrana tymani and middle ear were cleaned thoroughly by means of suction apparatus and cotton swabs. Alcohol or alcohol and bichloride were then rubbed back as far as the drum to sterilize the external canal. By inflation through the Eustachian tube or by suction to the external meatus pus was forced from the recesses of the attic by a tube-mouth. The culture was then taken with a platinum loop or a very small amount of cotton wound on a steel applicator, thoroughly sterilized.

If no results were obtained after a few injections of a vaccine it was considered important and a fresh one prepared. The organisms found in by far the greater number of their chronic middle ear suppurations were the staphylococcus (aureus or albus), bacillus pyocyaneus and diphtheroid bacilli. Pneumococcus was found much less frequently, staphylococcus citreus was found twice and the organism of Vincent's angina twice. Since employing the technique outlined, pure cultures were frequently obtained, whereas by the older methods it was not unusual to find two or three organisms in the culture. Streptococci were often found in the acute cases but rarely in the chronic ones.

DR. FREDERIC E. SONDERN, New York: Dr. Coates' paper has interested me very much because it has been my good fortune to see specimens of the type he describes and I would like to agree with him in reference to what he stated in regard to the use of the autogenous vaccines. He has seen repeatedly good results following their use. I was present when Nagel read his paper before the Triological Society in Washington and his results were astonishing in vaccine therapy. His description of the negative and positive phases interpreted clinically was beautiful and showed a very close observation. Many otologists have tried to follow the methods employed by Nagel with but little or poor results. In ear cases the successful outcome depends upon the condition of the ear. If there is dead bone present, you will not get the desired results. This also applies in using the vaccines in cases of sinus disease and inflammations of the mucous membrane of the nose. I have seen very gratifying results following the use of the vaccines, but it should be borne in mind that if the nose is so occluded that the patient cannot draw air through, especially if there is a sinus obstruction with pus present, the vaccines, I believe, are useless.

DR. MARTIN J. SYNNOTT, Montclair, N. J.: I understand from what has been said that there was no stock vaccine in the market for the treatment of hay fever. This may be true in the United States, but there is a stock vaccine from Sir Almroth E. Wright's laboratory in London (St. Mary's Hospital) which I have been using for two years; it is called "pollicin vaccine" and is the result of the work of one of Wright's assistants. He also has produced a diagnostic test which is to determine the susceptibility of the patient, and is used in the eye to test the conjunctival reaction. After this, the dose of the vaccine was determined upon. This method was found to be very troublesome because the patient objects to having the vaccine instilled in the eye, dreading any possible injury to that organ. In some 20 or 30 cases which gave encouraging results, it has been my practice to give small doses of the vaccine, usually 0.1 c.c. This is given twice a week and then increased 0.1 c.c. unless there resulted either focal, local or constitutional complications. The preparation I use is imported and handled through the London branch of Park, Davis & Company. The New York branch does not have it on hand. If the package is marked "for experimental purposes" and is unsealed it will come through the custom house.

DR. A. PARKER HITCHENS, Glenolden, Penn.: I have had but a limited experience in the treatment of hay fever, but I have been given chances to use the injection of the pollen extract in both the treatment and prevention of hay fever and a few things I have learned may be of interest to the members

of this Society. One of the most interesting, I think, is the difference in the intervals necessary between the doses if I wish the patient to be entirely free from symptoms. I do not know just what the pollen extract does; the reason for the results obtained remain for the future to tell. A dose of the pollen extract is followed in nearly every case by a relief of the symptoms, that is, if you give the specific pollen or protein. The majority of the cases of hay fever so-called are undoubtedly due to certain pollens; in the fall we meet with the rag-weed, and in the spring orchard grass and red top are chiefly responsible. I have had one patient whose paroxysms were produced whenever he was in proximity to the magnolia trees. He had hay fever through both seasons. The first year I tried him on injections every seven days, but I soon noticed that he began to have symptoms about the end of the fifth day. I then shortened the time of giving the injections to five days and he no longer had more symptoms.

I believe that every rational treatment for the prevention of hay fever should be preceded by the diagnostic test. I believe that the experience of many men with the ophthalmic reaction as used in tuberculosis will cause them to hesitate using this method in the eye, and I do not really think this is at all necessary. The intradermal test gives as good indications as the ophthalmic reaction.

I have had but a limited experience with nasal and respiratory conditions, but they too have been interesting. I have had, for instance, a woman under my care who was afflicted with asthma; following the use of the autogenous vaccines, once a week, she was relieved of her asthma.

I should like to ask those present who have had some experience in the treatment of patients with hay fever if they can corroborate the statement made by Dunbar in the *Journal of Hygiene*, that he had injected many normal persons with pollen extract and none had become sensitized. Did sensitization depend upon these injections or anything of the kind?

I believe that one of the most important points brought out in Dr. Coates' paper was that the bacterial vaccine must be used with brains. A large number of physicians did not use their brains when using the vaccines; if they get no good results, they say the vaccines were of no value. It should be remembered that no good could come from the use of the vaccines unless the antibodies formed came in contact with the bacterial factor. Every practitioner of medicine should take this into account. I have given about 1500 injections and I have never had the slightest concern regarding any evil results.

Vaccines are valuable before operations for infections of the upper respiratory tract; a shorter or longer course of vaccines should be given before these operations are performed. We have never seen any harm result from anaphylaxis. In the tissues are antibodies and proteins; any proper antigen placed in these tissues exerts a favorable influence. If the ferment does not exert a specific function, helping to get a reduction of the infecting bacteria, not coming in contact with the infecting bacteria, or something else, there was some fault somewhere.

DR. E. C. L. MILLER, Richmond, Va.: Certain observations make it appear as though hay fever caused an anaphylactic reaction. After the injection of protein the patient appears to be desensitized and more or less stimulated, and possibly other symptoms

may appear. If you continually inject patients with the same antigen, will not the patient become worse than he was before?

DR. GERALD B. WEBB, Colorado, Colo.: I think it is a reproach to the medical profession that it has never dealt with the so-called "common colds." All of us have seen benefit result from the plan outlined by Dr. Coates. Perhaps the colds are not all caused by the organism you think they are. In London they find many cases of pseudo-diphtheria which are called "colds." It is well known that influenza comes in waves; in Colorado we have not met with the influenza bacillus for some five years. During this time, however, we have met with cases that looked like grippé but no influenza bacillus was present. We were able to ameliorate the catarrhal condition, but we did not seem to be able to "hit the nail on the head." We could get some benefit from the inoculation of the catarrhal organism, diminishing the discharge, but we did not cure the patient of his symptoms.

Patients with hay fever are susceptible to more than one pollen. Cottonwood causes the trouble in some. In treatment we employ sometimes the catarrhal organism combined with the pollen vaccine and in one-half of the cases treated we have had successful results.

DR. GEORGE MORRISON COATES, Philadelphia, Penn.: In closing the discussion I wish to state that "colds" treated last about ten days; if untreated about eleven days.

A few days ago I did an operation for acute mastoiditis, obtaining a pure culture from the mastoid cells. In all my operations for mastoiditis, cultures are always made and vaccines regularly administered after operation, and my patients seem to get well in a shorter time. Dr. James F. McKernon of New York City, in cases of mastoiditis following scarlet fever and measles, uses the autogenous vaccines, thus reducing the time of healing to a considerable extent. In ear cases, the results of Nagel's work brought about much skepticism, but his work can be vouched for. In certain ear cases of the chronic type, even when necrosis is present, we can raise an artificial immunity and terminate the necrosis in a short time. It may take longer, but in the presence of a slight degree of necrosis, the use of bacterial vaccines influences the course of the disease very materially.

Election of Officers: President, Dr. J. W. Jobling, College of Physicians and Surgeons, Columbia University, New York City; Vice-President, Dr. George P. Sanborn, Boston, Mass.; Councilman, Dr. John A. Kolmer, Philadelphia, Penn.; Treasurer, Dr. Willard J. Stone, Toledo, Ohio; Secretary, Dr. Martin J. Synnott, Montclair, N. J.

(To be continued)

Cerebro-Spinal Fever. By THOMAS J. HORDER, M.D.
London: Oxford University Press, 1915.

Stimulated by the large number of cases of cerebrospinal fever in England in the past year Dr. Horder has collected and published in a small book of 170 pages the essential facts concerning this disease. The book presents nothing original; it aims only to present in readily available form the widely scattered studies of many individuals. The author has been very successful in condensing his material into very compact form.

Harvard Medical School.

THE PROFESSION OF MEDICINE.

A COLLECTION OF LETTERS FROM GRADUATES OF THE HARVARD MEDICAL SCHOOL.

EDITED BY ARTHUR B. EMMONS, 2D, M.D.

ATTENTION is called to the publication of Dr. Emmons, as outlined in the title above.

As stated in the preface, this is an analysis of letters received from ten classes of recent graduates, and is studied for the purpose of obtaining suggestions to aid students and young graduates in deciding their careers in medicine, and if possible, to learn how to improve the teaching of medicine as conducted in the Harvard Medical School.

The scheme is well conceived, well arranged, and the statements secured have been logically analyzed.

So far as the purpose and execution of this plan are concerned there is nothing omitted, and very little to criticize. Whether this study will lead to practical results or not, remains to be seen, and depends on whether the subject receives free discussion by those able to make the changes.

Very few of the answers deal with certain fundamental questions which are taken up by Dr. Emmons. Most of the criticisms of these recent graduates speak of lack of instruction in one or two comparatively unimportant subjects, or deal with the financial returns of the early years of practice.

Most of the criticisms reflect more on the practitioner than they do on the school, for even though there may be some deficiencies, in either the course or the method of teaching, it seems fair to assume that if a man had been desirous of perfecting himself along certain lines, the opportunities were not wholly lacking both before and after graduation, and the disappointments resulting from insufficient remuneration are due largely to the individual.

The mental irritation incident to competition, and unfair treatment by patients, also seems to indicate some inherent defect in the individual, for no work really worth doing is free from annoyances of various kinds, and one may well question whether the complainant has studied himself and intelligently tried to adjust his mental equilibrium.

One very important and well accepted belief seems to be substantiated by many of the letters, is that graduates of medical schools are not finished products. Possibly this must always be so, but theoretically, in the ordinary routine work of the doctor, it should not.

If a man settles in a community where he is expected to know simple therapeutic problems, and do minor surgery, and does not feel sure of himself in the presence of a case of dysentery, or cannot amputate a finger creditably, he has not been properly prepared, and must use his patients for study and practice. This is not fair, and sometimes the intelligent layman detects the impostor and assumes that medicine is less scientific than it really is. Medicine will never take its proper place in the world until a carefully regulated system of advancement of young practitioners is adopted.

Each one should demonstrate ability to those competent to judge before holding himself out to the public.

The medical schools hand the graduates over to the hospitals for practical work, in some cases, but not always, for some men enter practice immediately after graduation, and it may fairly be questioned whether all small hospitals give a service sufficiently complete to thoroughly equip a practitioner.

The medical school concerns itself more in teaching the theory of medicine, and even though it does have clinical material and clinical courses, does not always require a sufficient number of practical demonstrations to show that the graduate has more than a theoretical knowledge of medicine.

Again, medical schools may not require of their matriculates sufficient fundamental or natural qualities which may enable a man to develop into a good physician.

Dr. Emmons refers to this on page 109, where he speaks of the desirability of a probationary period.

It is certainly true that young men should not spend from four to six years in study, only to find that they are unfitted temperamentally to practise.

Admission to a school is almost always secured by the attainment of a certain minimum preliminary educational standard. If a person could be admitted to a school for a limited time, during which every effort should be made to demonstrate what the practice of medicine really is, and what it ought to be, for the purpose of determining whether a certain candidate might reasonably expect to be adapted to the vocation, with the understanding that he should withdraw if not approved, some misfits might be avoided, and there would be less grumbling later on about the inadequate returns and unfair competition, for no man should enter medicine unless he can look beyond the physical hardship, and also the financial return, which is too often the only personal measure of success.

Under any system the men of unusual ability will climb, but we need a plan whereby the honest and efficient person, without great ability, can do work that he is fitted to do, to the end that he may serve the public up to, but not beyond his own efficiency, and fill his social niche.

A study of this work of Dr. Emmons leads one to speak of some medical problems not fully considered in the pamphlet, and one is led, after reading the replies to the letters, to suggest an analysis of the men who wrote them, for one cannot give due weight to criticism unless one knows the writer and his environment.

The plan to omit the name of the writer may lead to free criticism, but it also prevents the compiler from considering the personal equation, which would have been a valuable factor.

In justice to the public, one wonders oftentimes what methods may be employed in the future to determine the real value of a man's work, and the question arises as to the advisability of requiring some end result, or checking system, on the work of the private practitioner. If it is necessary in the case of a hospital, why not even more so for the great mass of people who do not make use of hospitals?

The public as a class, is wholly incapable of correctly estimating the quality of medical service,

and one may be pardoned for the suspicion that supervision exercised very little beyond the student days, is inadequate.

In law, one man's work has usually to be scrutinized by his opponent, but in the chamber of the sick there is often no check on incompetence.

Why should not medical schools, and the profession, teach that the best practice of medicine in the home, requires team work in all important cases? This is advocated by certain individuals. Why not have it established as an approved custom, so that the young man would be expected to work with groups of older men, and be advanced according to his efficiency.

This is Utopian, and contrary to the ambitions of the average beginner, but seems to the writer to be sound.

The work done by Dr. Emmons warrants careful study, not only by the medical school, but by practitioners at large, who share in the responsibility of the medical profession to the public.

WALTER P. BOWERS.

HARVARD MEDICAL SOCIETY.

BOSTON SOCIETY OF MEDICAL SCIENCES PROGRAM.

*Amphitheatre of the Peter Bent Brigham Hospital,
Tuesday Evening, December 21, 1915.*

Dr. S. B. WOLBACH in the chair.

EXHIBITION OF CASE.

DR. CHANNING FROTHINGHAM, JR., "A Case of Bothrioccephalus Latus Infection."

Paper of Dr. E. E. TYZZER: "Factors in Tumor Immunity."

It appears important to consider resistance to spontaneous tumors and to transplanted tumors separately. While recovery from malignant tumors is of rare occurrence, local regressions of tumor nodules are not uncommon, although the tumor may be actively growing elsewhere. Certain organs apparently furnish a soil favorable for the growth of certain types of tumor. Tumors of the lymphoma group are usually largely restricted to the lymphoid tissues. Other types of tumors are prone to invade the bone. In certain cases where there is satisfactory evidence of general dissemination of tumor cells, metastases are found in certain organs, while they are absent in others. The white cells of myelogenous leukemia implanted beneath the skin fail to form tumor masses but are quickly absorbed. Likewise the tissue from the tumor masses in Hodgkin's disease implanted beneath the skin disappear at once, so that there is no trace within a period of a few days.

It is difficult, however, to judge to what extent the result depends upon the biological character of the tumor and to what extent on the peculiarities of the body tissues. It is quite impossible to state that one individual is

more resistant to cancer than another, from the fact that we do not know but what the tumors in the two cases are biologically different. It is possible, however, by employing the experimental method either to use the tumor as a constant with which to measure the resistance offered by various animals, or to use a uniform type of animal with which to measure the differences in the biological character of various tumors.

TRANSPLANTED TUMORS.

Immunity may be produced in certain instances with transplanted tumors by previous inoculation of other normal tissues or of badly growing tumors. It is necessary, however, to employ living cells, and immunity cannot be produced with dead cells or tissue extracts. If implants of a tumor are made in the animal in which the tumor arose (autoplastic grafting), growth is almost invariably obtained. If implants are made into other individuals of the same species, the implants grow more frequently in the more closely related individuals and less frequently in the less closely related (homeoplastic graft). The implantation of tumor tissue to a foreign species is invariably unsuccessful (heteroplastic grafting).

The microscopical examination of implants in non-susceptible animals shows that for a period of six or seven days the tumor grows as well as in the susceptible animal. At the end of this period a reaction appears, characterized by infiltration with leucocytes, which increases in amount until the tumor tissue is completely isolated from the supporting tissues upon which it depends for its nutrition. If such animals, in which an implant has been destroyed, are again inoculated with tumor, the reaction now appears more promptly and the tumor disappears at an earlier period.

These phenomena are explained by the production in the immunized mouse of an immune body, which has apparently no direct cytotoxic or cytolytic action on the tumor cells but which serves to make the latter positively chemotactic, as the result of which inflammatory reaction appears which isolates the tumor and leads to its eventual destruction.

THE INHERITANCE OF SUSCEPTIBILITY TO IMPLANTED TUMORS.

Non-susceptibility is found to have as its basis a *foreignness or unlikeness* of the tissues, making them incompatible with the growth of a given tumor. The unlikeness may be based upon differences with respect to a few factors or differences with respect to many factors. There is now evidence that these factors are inherited according to Mendel's law, since it is recognized that non-susceptibility is dependent, not upon differences with respect to a single inherited factor, but upon differences with respect to a large number. Tumor immunity is thus based on foreignness or incompatibility with respect to the relationships of tissues. This holds true whether we take the tumor or the individual as the constant factor with which to test the other. We find that the reactions most favorable for a tumor growth are found in the genetically homogeneous material. Differences in the behavior of tumors arising in homogeneous races are attributable to the acquisition of new characters and the fact that these breed true is demonstrated by the

propagation of tumors by transplantation over a period of many years. Tumors, therefore, appear to be of the nature of somatic mutations.

The following viewpoint concerning the nature of tumors and their relationship to other tissues is offered.

The relationship of normal tissues is one of symbiosis, that is, they are mutually beneficial. The anomalies and benign growths have the relationship of commensals, in that the latter, although not especially harmful to the individual, are, nevertheless, not beneficial. Malignant tumors, on the other hand, behave in many respects as parasites developing at the expense of other tissues, and having no useful function. They are not of such a nature, however, that they stimulate immunity sufficient for their destruction.

DISCUSSION.

DR. COUNCILMAN: There are some things about certain tumors found in man which point toward immunity. The period which occurs before metastasis sets in probably represents a phase of immunity. At such a time the spread of the new growth is not inhibited by lack of opportunity, for the cells often have access to the circulation. The cases which seem to offer no limitation to a diffuse growth of the tumor, furthermore, suggest an absence of immunity as compared with the average case.

DR. TYZZER: An example of unlikeness is furnished by the external characters, for example, albinism. The factors in tumor immunity are analogous to the well known factors in color inheritance. In the case of the dancing mouse, there are twelve or fourteen known factors.

Paper of DR. W. G. SMILLIE: "Report of an Epidemic of Septic Sore Throat, with Some Studies of the Etiological Agent."

Since the epidemiologic study of Winslow there have been reported each year two or more epidemics of tonsillitis due to the use of infected milk or milk products. In most instances a streptococcus has been suspected as the causal factor.

In January, 1915, Smith and Brown showed that the streptococcus found in the throats of patients, in the infected milk, and even in the udder of infected cows, was a human strain with a group of definite characteristics.

1. A type of hemolysis, called by them the beta type.
2. Characteristic carbohydrate fermentation reactions.
3. Characteristic virulence to rabbits.

In April, 1915, there was an outbreak of septic sore throat in a suburb of Boston. There were 227 cases with 2 deaths. Fifty per cent. of the cases were mild in type, forty per cent. moderate in type, and ten per cent. severe.

The type of streptococcus described by Smith and Brown was isolated from the suspected milk, from the throats of the patients, and from the throats of five of the dairymen. The identity of the types of streptococci was proved by both cultural characteristics and agglutination reactions.

Four of the dairymen were probably infected at the same time as were the patients and were a part

of the epidemic. One of the dairymen had had sore throat and fever three weeks previously, and at the time of the outbreak had a rather characteristic desquamation on his hands and feet. He had been helping with the milking during his convalescence. It seemed probable that this individual, directly or indirectly, was a source of infection of the milk supply.

DISCUSSION.

DR. ROSENAU: One of the most interesting facts connected with this epidemic is that the infection is a human disease and may not be very pathogenic for the cow. The cow, accordingly, may be a carrier of this organism.

The name septic sore throat is a barbarous one. It is highly desirable that some new and more appropriate designation be adopted.

The motto of this whole study is—pasteurize the milk.

DR. PLACE: Infections with this organism may give pictures which cannot be differentiated from scarlet fever. The question which then arises is whether this streptococcus is the organism responsible for scarlet fever. A number of the cases reported tonight had typical scarlet fever clinically. My own belief is that the bacteria responsible for these infections are entirely distinct from the virus of scarlet fever. The streptococcus, however, may persist in cases of scarlet fever for long periods. The scarlet fever virus and the streptococcus apparently may both enter the milk supply.

The paper of Drs. W. B. Cannon and McKeen Cattell on "Some Conditions Controlling Thyroid Activity," was postponed until January 11, 1916.

ERNEST G. GREY, M.D., *Secretary.*

Book Reviews.

Diseases of Infants and Children. By HENRY DWIGHT CHAPIN, A.M., M.D., and G. R. PISEK, M.D., Sc.D. Third revised edition. One volume of 595 pages. Octavo, illustrated by 179 cuts and 12 colored plates. New York: William Wood and Company. 1915.

This, the third edition of this well-known work since 1909, has been thoroughly revised and brought up to date. The newest tests, such as the Schick and the Iletin, have been described. A modified Binet-Simon test for mental deficiency has also been added. The book has been entirely reprinted from new plates on thinner and lighter paper and has been reduced in price. Like the other editions it is, however, unsatisfactory in that it is incomplete and too much in the nature of a compendium. We regret, as we have before, that the authors have not seen their way clear to give us the comprehensive and authoritative work for which they are so eminently fitted.

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Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 Massachusetts Ave., Boston. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish one hundred reprints free to the author, upon his written request.

All letters containing business communications, or referring to the publication, subscription, or advertising department of the Journal, should be addressed to

ERNEST GREGORY, *Manager.*

126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

ANNOUNCEMENT.

WITH its current issue, the BOSTON MEDICAL AND SURGICAL JOURNAL, the oldest medical weekly in America, begins its second year under new administration. While remaining an independent Journal of Medicine and Surgery, its association with the Massachusetts Medical Society, as the official organ of that organization, has made possible, we believe, a wider range and intimacy of service to the profession. The value of this continuing association should only increase with time; and the JOURNAL takes a grateful pleasure in extending to its cordial collaborators of the Society sincere appreciation of their energy, patience, uniform courtesy, good will and devotion.

In the light of a year's experience under the changed conditions, there seems every reason to hope that, in its widened sphere, the JOURNAL may steadily increase the quality and extent of its representative service. The Massachusetts Medical Society will continue to subscribe to the

JOURNAL for each of its members in good standing, so that the JOURNAL will be sent to them in addition to its regular subscribers.

The attention of readers is particularly called to the continued high ethical policy of the JOURNAL as regards advertisements, a policy which is under the constant supervision of a committee of experts and is a sufficient evidence of the reliability of any matter that appears in its advertising pages.

During the past year, the current literature department of the JOURNAL has been augmented; a new department has been established in which can be presented more fully topics of interest and importance connected with the medical schools and affiliated hospitals. The JOURNAL has adopted the standard library size of reprint, and will hereafter furnish 100 reprints free to each author, upon his written request.

Particular attention is directed to the new department of Therapeutic and Preventive Medicine appearing in the current issue of the JOURNAL for the first time. This department is intended to present articles devoted to the more practical aspects of the treatment and prophylaxis of disease, especially medical, for the benefit of general practitioners. Surgical papers and articles of research will appear as heretofore in the department of original articles and case reports in the clinical department. The first article in the new department is by Dr. Justin Herold of New York on the treatment of the important and frequent symptom, headache. Others, by well known authors, on the treatment of diabetes, syphilis, nephritis, and various common medical affections, will appear at least once a month.

During the coming year, the JOURNAL will continue under the same administrative and editorial direction. Its editorial policies will be under the determination and supervision of the same committee of consulting editors who have served so effectively during the past year. To the members of this committee, to his immediate editorial colleagues and assistants, to the abstractors and to all who have contributed or assisted in the preparation and conduct of the JOURNAL from week to week the editor-in-chief most cordially offers his grateful acknowledgment and appreciation. And to all its readers and well-wishers the JOURNAL expresses its sincere good wishes and its desire and hope worthily to represent and serve the medical profession during the new year.

ENDOWMENT OF THE AMERICAN COLLEGE OF SURGEONS.

THE American College of Surgeons begins the new year with an announcement that it has secured from its Fellows an endowment fund of \$500,000. This fund is to be held in perpetuity, the income only to be used to advance the purposes of the college. By this means lasting progress toward the purposes of the College is assured.

The college, which is not a teaching institution but rather a society or a college in the original sense, now lists about 3400 Fellows in Canada and in the United States. Primarily the college is concerned with the training of surgeons; but the significant fact in connection with the endowment just secured is that it has come from the surgeons themselves, inspired by a motive for better service to the patient. Ideals in the profession of medicine are living things. Probably no more convincing proof of this fact exists than the sacrifice which the surgeons of this continent have made willingly in order to raise this fund.

To begin with, these ideals are to find concrete expression in the following modes of activity:

1. Since the whole problem of the training of specialists for the practice of surgery is the primary purpose of the college, the regents propose at an early date to present a clear conception of the college to the undergraduate medical students of this continent. The regents, further, will ask each senior student of this group who has in mind to specialize in general surgery or any branch of surgery to register with the college. As these students, then, serve later as internes and as surgical assistants, they will be requested to report these facts to the college. The college, in turn, will systematically seek information as to the ability and character of such men; and the information thus obtained becomes the basis of admission to Fellowship in the college. In addition to this procedure, the regents will insist upon the proper keeping of case histories, and they will endeavor to stimulate in these men right ideals of medical practice. In this program they ask the active co-operation of the faculties of the medical schools and of all practitioners of medicine.

2. Inasmuch as proper training in surgery is inseparably involved with the conduct and efficiency of hospitals, the college will seek accurate

data on all matters which relate to hospitals. From time to time it will publish studies upon hospital problems, the purpose being always to be helpful to the hospitals. These publications, further, will inform recent medical graduates as to where they may seek adequate general or special training in surgery. To be concrete the college will deal with such problems as (a) the proper equipment for medical diagnosis, *e.g.* well equipped laboratories for chemical, pathological, and x-ray work; (b) the proper forms for case histories and the facilities for keeping these records; (c) the management and the curricula of the nurses' training schools; (d) the specialization essential in any well organized hospital.

3. The college will ask the faculties of medical schools to consider the advisability of conferring a supplementary degree of proficiency in general surgery and in the various specialties of surgery.

4. The college will issue readable monographs, educational in nature, to the press, to the general public, to hospital trustees, and to the profession of medicine upon subjects of medical procedure and the whole meaning of fitness to practice surgery.

The entire impetus of the college springs from within its own membership. Necessarily that impetus implies reform. But there is a vast difference between reform preached at men and reform innate in the hearts of men which finds expression at their own initiative. Whatever impetus the college possesses, it originates among the surgeons themselves, it is not an extraneous force. Rather, out of the widely divergent views on many subjects among the Fellows, the aims of the college rise as those time-tried aspirations which are inherently the basis of all that is valuable in the vocation of surgery. The purposes of the college are concerned directly with matters of character and of training, with the betterment of hospitals and of the teaching facilities of medical schools, with laws which relate to medical practice and privilege, and with an unselfish protection of the public from incompetent service; in a word, they embody those ideals which have stood the test of centuries. Upon these the Fellows are united. These are the ideals which each Fellow, single-handed, has endeavored to foster, and the expression of them to-day through the colleges comes as a mass-consciousness of the whole body.

JOHN G. BOWMAN.

THE AMERICAN JOURNAL OF ORTHOPEDIC SURGERY.

BEGINNING with its January number, the *American Journal of Orthopedic Surgery* has transferred its place of publication to Boston, and instead of being a quarterly, becomes a monthly journal under the able editorial direction of Dr. Mark Rogers of this city. While remaining the official organ of the American Orthopedic Association the *Orthopedic Journal* expresses its intention to enlarge its scope and increase its usefulness to the general physician and surgeon as well as to the orthopedist. It is the only journal in the English language devoted entirely to bone and joint surgery and should continue, as it has done in the past, to be one of the leading publications of this specialty in the world.

The transference of the editorial and publication headquarters of the *American Journal of Orthopedic Surgery* to Boston is particularly appropriate, in view of the foremost position which the profession of this city has taken in the development of orthopedics in America. The work of Bradford and the group of distinguished younger surgeons trained in his school, or succeeding to his leadership, has made Boston recognized internationally as one of the great orthopedic centres of the world. Moreover the hospital facilities for orthopedic surgery in this city make possible further leading development of the science by Boston surgeons.

The enlarged scope and frequency of publication of the *American Journal of Orthopedic Surgery*, marking the third definite advance in the policy and interests of this publication, should enable a great increase in its possibilities of scientific publication and of practical service to the profession. Under the editorship of Dr. Rogers we feel sure that the promises evidenced by the contents of this first issue will be abundantly fulfilled; and it is with the greatest pleasure that the BOSTON MEDICAL AND SURGICAL JOURNAL extends to its contemporary the most cordial greetings of the New Year and confident good wishes for its deserved success.

EPIDEMIC RESPIRATORY INFECTIONS.

DURING the past three weeks there have been, throughout the eastern and northern sec-

tions of the United States, especially in large cities, extensive and sometimes serious epidemic respiratory infections. Often these have been termed influenza, but improperly so, since it does not appear that they have in any important instance been due to the influenza bacillus. Rather they have been of the type commonly, though unsatisfactorily, described as grip, or septic sore throat. The clinical manifestations have been protean, from those of the simple "cold," through the categories of acute tonsillitis and bronchitis, to the immediate or terminal phenomena of pneumonia.

The extent of these epidemic respiratory infections has in some communities been very great. In Chicago, on a given day, 85,000 children were absent from the public schools for this cause. In Philadelphia the total number of cases is estimated to have been 15,000 and 650 deaths of acute respiratory infection are said to have occurred during the week ended December 25. In Camden, N. J., there were 1000 cases and 50 deaths during the same week. Similar epidemics are reported in Milwaukee and Detroit, and almost universally in smaller communities.

In New York the manifestation of the epidemic seems to have been predominantly pneumonia, 2000 cases of pneumonia having been reported in that city alone during Christmas week.

In Boston, where we can speak of the epidemic from personal observation, it has seemed that nearly everyone has or has had the prevailing infection. Fortunately, in our locality, the disease has apparently been of a rather mild, non-virulent type. It has appeared likewise in hospitals, where it has run through entire wards, and, in surgical cases particularly, has given rise to puzzling complications, simulated other infections, and in some instances led to serious metastatic processes.

The conditions favoring the wide and rapid spread of these epidemic respiratory infections are obviously those of over-crowded, super-heated and ill-ventilated public conveyances, meeting-places, offices, and homes, combined with inclement weather and improper, usually excessive clothing. The personal prophylaxis depends upon avoidance of these conditions and maintenance of physical resistance by abundant fresh air and sleep, good food, adequate catharsis and individual hygiene.

COMPULSORY INDUSTRIAL HEALTH INSURANCE.

It is announced that there will soon be filed before the Massachusetts General Court a bill, introduced under the auspices of the American Association for Labor Legislation, providing for a system of compulsory health insurance for all industrial workers receiving salaries of \$100 a month or less. It is intended that this insurance shall cover any sickness, accident or death not covered by the Workmen's Compensation Act. Further benefits are provided to insured members in the way of medical, surgical and nursing attendance, medicines and surgical supplies, and cash, maternity and funeral allotments. For the administration of this system the plan provides for the appointment of a state social insurance commission of five members selected by the Government.

Until further details are available, further comment on this bill will not be made; but when the complete text of the bill can be obtained, it will be discussed editorially in a future issue of the JOURNAL.

EUGENICAL NEWS.

THE Eugenics Record office at Cold Spring Harbor, Long Island, N. Y., begins this month the publication of a small bimonthly bulletin entitled "*Eugenical News*," which is to be devoted to reporting the work of the office. This organization has now trained over 100 field workers, of whom, at least a third are still actively engaged in social and eugenical research. The investigation of family histories is also being made under the direction of the office by a number of other agencies. The *Eugenical News* will be a medium of intercommunication between these agencies and those interested in eugenics throughout the country. It is intended also to include in its field other eugenical news, comprising notices and reports of meetings, eugenical laws passed by different states, and the growth of knowledge about selection, natural fecundity, control of death rate and of national migration. This publication seems to have a definite field in a new and still elementary branch of medico-social science and its progress will be watched with interest by physicians, social workers and publicists.

DR. DAVID WILLIAMS CHEEVER.

THE death of Dr. David Williams Cheever, at the passing of the old year, took from the surgical profession of Boston one who had been for many years its dean,—a distinguished, familiar, and universally respected figure. Descendant of a family of intellectual attainments for eight generations in New England, the late Dr. Cheever exemplified the finest accomplishment and character of the type of which he was so eminent a representative. Austere and devoted in his manner and habits of life and work, he saw always with a single purpose the ideal of professional duty and service. His writings, which have appeared often in these pages, were testimony, like his life, of the sincerity and integrity of his professional career. In his long years of labor and achievement, he has left as a legacy to the profession a high example of unselfish and unswerving fidelity and of scientific achievement. and to his worthy and beloved namesake and successor a precious heredity of inspiration to fine ideals.

MEDICAL NOTES.

PREVALENCE OF MENINGITIS, POLIOMYELITIS, AND TYPHOID FEVER IN NEW YORK.—The weekly report of the United States Public Health Service for December 17, states that during the month of October, 1915, there were in New York State thirteen cases of cerebrospinal meningitis, seventy-one of poliomyelitis and seven hundred and seventy-two of typhoid fever.

TYPHUS FEVER IN MEXICO.—In recent issues of the JOURNAL we have noted the occurrence and extension of an epidemic of typhus fever in and about Mexico City. It is believed that there are at present 25,000 cases of the disease in that city, and report from Washington and New York on December 24 states that the American Red Cross and the Rockefeller Foundation will probably unite in an expedition to eradicate the disease as was recently done in Serbia. At its latest meeting the executive committee of the National Red Cross adopted the following resolutions on the subject.

"That subject to the necessary permission and co-operation of the Mexican government, the American Red Cross is prepared to send to Mexico a competent corps of physicians, sanitarians and nurses to combat the present epidemic of typhus fever in Mexico and co-operate with the Mexican government and Mexican physicians to that end."

VITAL STATISTICS OF NEW JERSEY.—The report of the State Board of Health of New Jersey for the year ended October 31, 1914, shows a constantly lowering death-rate with a correspondingly lowering birth rate. The marriage rate, however, has slightly increased. As a cause of death consumption stands first, with diarrheal diseases of children and pneumonia second and third respectively. A combination of figures showing the causes of deaths for the past thirty-five years gives consumption as greatest cause and diarrheal diseases of children as second. The death-rate from consumption for the present year, however, is the lowest on record and undoubtedly the lowest in the history of the state. Cancer, on the other hand, is steadily increasing. Thirty-five years ago the number of deaths from this disease was 378; a rate of 3.7 per 10,000 population. In the year 1913 the number of deaths had risen to 2120, with a rate of 7.65, a proportion which is almost doubled. The number of deaths from suicide was 444, a slight increase over the previous year.

INFANT MORTALITY IN THE UNITED STATES.—The recently published third annual report of the Children's Bureau of the United States Department of Labor emphasizes the importance of the relatively high infant death-rate among the babies of working mothers. During the past year the infant death-rate in a large steel-making and coal-mining town was 134 per thousand as compared with 84 per thousand in a residential suburb. It does not follow, however, that the greater mortality in the one case is necessarily due to maternal employment rather than to the general environmental conditions of living. The necessity is also emphasized for developing standards of rural child welfare and for children in industry.

"The bureau reports a year of activity dealing with eight different phases of child welfare. It has been studying the social causes of infant mortality, doing constructive work for child hygiene, cooperating in a general test of birth registration, preparing a report on social care of mental defectives and of illegitimate children, reviewing the principles of community provision for recreation, compiling laws relating to children, and analyzing the administration of child labor laws and street trade regulations in selected typical states. It has also begun certain experimental activities which will prepare the way for the detailed studies of rural child welfare and the physical effects of child labor which it will undertake at some future time when staff and equipment permit."

NEW YORK DEATH RATES.—The death rate from influenza and pneumonia has taken a jump. According to figures compiled by the Department of Health the noteworthy feature of the mortality report for the week ending December 25 is the abnormally high death rate from influenza and pneumonia. The number of deaths from in-

fluenza is five times as great as during the corresponding week of last year, and twice as numerous as the deaths from this cause during the previous week. There were nearly 200 more deaths from pneumonia last week than during the corresponding week of 1914. If we estimate that the mortality of pneumonia is about 20 per 100, there were about 2000 cases of pneumonia in the city last week.

The mortality of the acute infectious diseases, considered as a group, was lower than during the corresponding week of last year. The total number of deaths reported for the week was 1724 as compared with 1363 during the corresponding week of last year, the respective rates being 15.49 and 12.74. The death rate for the 52 weeks of the year was 1355 as compared with 1360 for the corresponding period of last year.

EUROPEAN WAR NOTES.

FRENCH AND GERMAN ARMY DEATH RATES.—Report from London on December 20 states that during the early months of the war 85% of the German wounded were returned to military service, while 12% were disqualified from further service and 3% died. During the later months of the war these figures are said steadily to have improved and at present 89½% of the German wounded are returned to service, 8.8% are unfit for further service and the death rate is only 1.7%.

Report from Paris on December 20 states that during the early months of the war the mortality among French wounded was 5.3% and that at present it is only 1.8%. Among the civilian population of Paris, the death rate in hospitals in times of peace is 10.6%.

CHOLERA IN AUSTRIA-HUNGARY.—The weekly report of the United States Public Health Service for December 17, 1915, states that during the week ended September 25 there were in Austria 937 cases with 508 deaths of Asiatic cholera. In Hungary during the three weeks ended October 17 there were only 90 cases and 53 deaths.

SCARLET FEVER IN GERMANY.—Report from London on December 27 states that scarlet fever is epidemic in Bromberg and a number of neighboring villages of Posen.

THE HOSPITALS IN BELGIUM.—In a recent issue of the *Manchester Guardian* is the following item descriptive of the Belgian hospitals as at present serving the wounded of that nation at various points.

"The one at Rouen, started by an English committee, is specially for mechanotherapy. Here are all kinds of electrical appliances, massage, hot-water treatment, and mechanical apparatus for restoring the muscles to a normal condition. All this apparatus, and also wonderfully perfect artificial limbs, are made by the men themselves in workshops attached to the hospital.

for all the depots are perforce run on the self-help principle. There are several Belgian convalescent hospitals scattered through Normandy and Brittany, generally in remote inland villages, where a disused factory or manor house or convent can be adapted. Pitiful accounts have reached England of no beds, or children's beds lengthened by a box at the end, of no heating apparatus, of no lamps, few blankets, no music, no games, of incomplete hospital stores and instruments—in short, of convalescent soldiers with all the odds against their convalescence.

"But help to enable them to help themselves is now reaching these Belgian convalescent depots, through an English committee. Yet another branch of war service has been developed by the Belgians with great ingenuity and resourcefulness—namely, depots for mutilated or amputated soldiers. A beautiful estate on the Seine was lent last July, and already there are huts on it for 600 inmates, and soon there will be accommodation for 2000. Every variety of trade and occupation is taught, so that each disabled man finds out for what he is best fitted. He is paid a small wage by the hour. This is saved for him, so that if he returns to Belgium after the war he will not only possess a means of earning a living, but also a little capital. A similar depot which was started with the help of a loan from an English woman married to a Belgian has paid the loan back, and is now self-supporting and accepts large contracts for goods for the British army."

WAR RELIEF FUNDS.—On January 1, 1916, the totals of the principal New England relief funds for the European War reached the following amounts:

Jewish Fund	\$965,886.00
Red Cross Fund	142,563.12
Belgian Fund	80,214.01
Serbian Fund	58,994.31
Allied Fund	46,105.80
French Fund	33,362.54
Armenian Fund	27,010.42
Surgical Dressings Fund	16,464.00
La Fayette Fund	14,488.99
Italian Fund	13,922.02
Polish Fund	12,232.38

BOSTON AND NEW ENGLAND.

SOURCE OF INFLUENZA.—In conjunction with the editorial in another column of this issue of the JOURNAL on "Epidemic Respiratory Infections," it is of interest to note the following communication on the subject from a physician in the daily press of January 2:

"In Dunglison's Medical Dictionary, which I first opened some years before my prime, grippé, or la grippe, is defined as influenza. However, this Russian disease, like many another unwellcome immigrant to our shores, came across the ocean in a reverse direction and against the atmosphere currents. It cannot be premature for

me to explain to the readers of a second generation since its arrival in America, now fully 25 years, some of its peculiarities and some remote effects. Early in the year of its invasion, it was my privilege to observe numerous cases of this protean and serious infectious disease. At this time, its source had not been discovered nor its 'bacillus' named. For myself, I then suffered to recognize its local power in the naso-pharynx and in the ears, and when, later, it had been more or less endemic, to perceive its protean character. Experience has made me bold, and circumstances taught me that if one really desires to prevent himself from taking the disease, he must avoid getting nervously exhausted. To cure it, he must rest. After one is seized with the infection, it becomes essential to avoid depressing drugs and secure local treatment at the spot where the disease invaded the system.

"There are very many cases which are called pneumonia, or more properly, pneumonic, and are in reality the cases in which a large area of lung tissue is involved, but wherein only very small bronchial tubes are inflamed. The actual depressing effects of the virus of influenza are felt in the nervous system. The area of lung involved is of little moment if this virus is prevented from entering through the naso-pharynx. It is here that the point of invasion is discovered. This also proves the futility of isolating patients already infected. The germs were in the air, were breathed for many hours and finally grew and produced the toxins or virus which later lay the victims low. These facts are proved by studying the various epidemics or endemics. It is more important to know what to do with the invader than it is to know where he came from. So if he can be reached as he enters one's economy he can at least be inhibited, if he cannot be prevented from entering.

"EDMUND D. SPEAR, M.D."

RETURN OF DR. OSBORN.—It is announced that Dr. Stanley H. Osborn, who has been serving for several months as a war surgeon in Serbia and at Vienna, is to return to Boston to accept the recently vacant position of health officer in the Berkshire District of the Commonwealth of Massachusetts, succeeding Dr. Lyman A. Jones whose transfer to the Essex County District we noted in a recent issue of the JOURNAL.

HOSPITAL BEQUESTS.—The will of the late Patrick H. Cooney of Natick, Mass., which was filed for probate on December 22 in the Middlesex Court, contains bequests of \$5000 to the Leonard Morse Hospital of Natick, and of \$1000 to the Carney Hospital, South Boston. The sum of \$500 is left to the Natick Visiting Nurse Association.

MASSACHUSETTS VITAL STATISTICS.—Advance sheets have recently been issued of the seventy-

third annual report of the secretary of the Commonwealth of Massachusetts on the vital statistics of this state for the year 1914. The report has been prepared under the editorship of Mr. Frank S. Drown, an expert from the United States Children's Bureau. Considerable attention is devoted in the report to the discussion of birth rates and to methods for the more complete and perfect registration of births.

During the year 1914 there were in this state 9339 births, 52,978 deaths, 32,588 marriages, and 2200 divorces.

The birth rate in 1914 was 25.8 per 1000 population, being the same as in the preceding year, but greater than in any previous year since 1908, when it was 26.9. The average for the sixty-four years, 1851 to 1914, was 26.4.

The marriage rate in 1914 was 18 per 1000 population, being .3 above the rate for 1913 and .1 below the average for the ten years 1904 to 1913. The average rate for the sixty-four years, 1851 to 1914, was 18.9.

The divorce rate in 1914 was 156 per 100,000 married population, an increase of 10, or 7 per cent. over the average for the five-year period 1908 to 1912.

The death rate was 14.7 per 1000 population, the lowest ever recorded in this Commonwealth, notwithstanding the fact that there was a larger absolute number of deaths than in any previous year except 1913, 1911, 1910 and 1907. The average death rate for the ten preceding years, 1904 to 1913, was 16 per 1000, and the average rate for the 64 years, 1850 to 1914, was 18.5.

The infant mortality rate was 105.9 per 1000 live births, the lowest ever recorded in this Commonwealth, the rate for the preceding year, 1913, being 110.1, while the average for the ten years, 1904 to 1913, was 128.4. Notwithstanding the growth in population and the steadiness of the birth rate there was also a reduction in the actual number of infant deaths in 1914, as compared with 1913, of 192, or 1.9 per cent.

In the city of Boston the infant mortality rate was 103 per 1000 live births, as contrasted with a rate of 110 in 1913. There was also a reduction in the actual number of deaths under one year, as compared with 1913, of 98, or 4.6 per cent. Thus a large proportion of the salvage of infant life in Massachusetts during 1914 took place in Boston, where the infant welfare agencies have been most untiring in their campaigns for baby saving. These figures are probably an indication of the extent to which the adverse influence of urban surroundings on infant life may be avoided.

Mortality from all the epidemic diseases was below the average. The number of deaths from typhoid fever was the lowest on record, and the number of deaths from measles the lowest since 1898. The mortality from diphtheria and croup conjointly was the lowest on record except for 1913, 1912, 1911 and 1909. There were no deaths from smallpox.

Cancer caused a larger number of deaths than in any preceding year, as did Bright's disease (except for 1911), while the number of deaths from tuberculosis of the lungs was the lowest on record. The importance of cancer as a cause of death at the present time, both because of the number of victims and the practically uninterrupted increase since the beginning of registration, is sufficient to justify the somewhat extended space given to it in this report.

There was a decline in the number of views made by medical examiners in 1914 of 100, or 1.6 per cent., and a decrease of 410 autopsies, or 46.1 in 1914 took place in several counties, although the greatest reduction took place in Suffolk County, where the reduction amounted to 366, or 60.3 per cent.

CANDIDATES FOR DENTAL REGISTRATION.—It is announced that of 127 candidates who took the November examination for registration before the State Board of Dental Examiners, only 39 were satisfactorily passed.

Miscellany.

PHILIPPINE CIVIL SERVICE EXAMINATIONS.

BACTERIOLOGIST AND PATHOLOGIST (MALE).

The United States Civil Service Commission announces an open competitive examination for bacteriologist and pathologist for men only. From the register of eligibles resulting from this examination certification will be made to fill vacancies in this position. Bureau of Science, Manila, P. I., at salaries ranging from \$2,000 to \$2,500 a year, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The duties of this position will be to carry on research work in the laboratories of the Bureau of Science, combined with the regular routine bacteriological and pathological work.

The degree of M.D. or Ph.D. from a college or university of recognized standing, including at least one year's training in bacteriological laboratory work, is a requisite for consideration for this position.

The medical certificate on Form B. I. A. 2 should be executed in accordance with the instructions printed thereon. If it is impracticable for an applicant to appear before a Government physician or a pension-examining surgeon on account of his distance from such a physician, the medical certificate may be executed by any reputable physician other than the family physician of the applicant; but a person submitting such a certificate may be required to undergo another physical examination in case of appointment. Each applicant must file with his application his unmounted photograph, taken within two years. Tintypes or proofs will not be accepted. This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Forms B. I. A. 2 and 2118, stating the title of the examination for which the forms are desired, to the United States Civil Service Commission, Washington, D. C.; the secretary of the United States Civil Service Board, post office, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn.,

Seattle, Wash., San Francisco, Cal.; customhouse, New York, N. Y., New Orleans, La., Honolulu, Hawaii; old customhouse, St. Louis, Mo.; Balboa Heights, Canal Zone; or to the chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed and must be filed with the Commission at Washington prior to the hour of closing business on January 18, 1916. The exact title of the examination as given at the head of this announcement should be stated in the application form.

ASSISTANT SURGEON (MALE).

The United States Civil Service Commission announces an open competitive examination for assistant surgeon, for men only. From the register of eligibles resulting from this examination certification will be made to fill a vacancy in this position in the Bureau of Science, Manila, P. I., at a salary of \$1,800 a year, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

Applicants must have graduated in medicine from a medical school of recognized standing, and in addition have had special training in bacteriology, either during their medical course, or in postgraduate work. Statements as to education and experience are accepted subject to verification. Applicants must have reached their twenty-first but not their fortieth birthday on the date of the examination.

The medical certificate in Form B. I. A. 2 should be executed in accordance with the instructions printed thereon. If it is impracticable for an applicant to appear before a Government physician or a pension-examining surgeon on account of his distance from such a physician, the medical certificate may be executed by any reputable physician other than the family physician of the applicant; but a person submitting such a certificate may be required to undergo another physical examination in case of appointment. Each applicant must file with his application his unmounted photograph taken within two years. Tintypes or proofs will not be accepted. This examination is open to all men who are citizens of the United States and who meet the requirements.

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NOTICES.

CONFERENCE ON MEDICAL EDUCATION.—The Twelfth Annual Conference on Medical Education, Public Health and Legislation will be held at the Congress Hotel, Chicago, Monday and Tuesday, February 7 and 8, 1916, under the auspices of the Council on Medical Education and the Council on Health and Public Instruction of the American Medical Association.

Monday, February 7, will be devoted to medical education, and Tuesday, February 8, to medical legislation and public health.

All State Licensing Boards, State Boards of Health, State Medical Societies, Associations of Universities,

and other organizations interested, are invited to send representatives to this conference.

On Wednesday, February 9, the Federation of State Medical Boards of the United States and the Association of American Medical Colleges will meet.

Council on Medical Education,
N. P. COLWELL, *Secretary*.
Council on Health and Public Instruction,
FREDERICK R. GREEN, *Secretary*.

SOCIETY NOTICES.

BOSTON MEDICAL LIBRARY.—The annual meeting of the Boston Medical Library will be held in Sprague hall at the Library, on Tuesday, January 11, 1916, at 5.15 P.M.

Dr. John Mason Little, Jr., will give a talk, entitled "Medical Work in Newfoundland and Labrador."
Refreshments after the meeting.

WALTER L. BURRAGE, M.D., *Secretary*.

MASSACHUSETTS GENERAL HOSPITAL CLINICAL SOCIETY.—The next meeting will be held in the Out-Patient Amphitheatre at 7.15 P.M., on January 10, 1916.

- Subjects:
1. Hodgkin's Disease, Dr. M. Smith-Petersen.
 2. Diabetes, Dr. O. F. Rogers, Jr.
 3. Presentation of Pathological Specimens of Unusual Interest.

The visiting staff, the administrative staff, physicians, surgeons and students are cordially invited.

ELLIOTT C. CUTLER, M.D., *Secretary*.

RECENT DEATHS.

DR. RUDOLPH AUGUST WITTHAUS died at New York City on December 21, he was born in New York in 1847. After graduating from Columbia University in 1867 he traveled abroad, attended Sorbonne University, and from 1873 to 1874 the Collège de France. Returning to the United States he received the degree of M.D. from the New York University in 1875, and a few years later became professor of chemistry and toxicology at that institution. He was widely known as an expert on poisons and was author of a number of books on their detection.

DR. THOMAS JOSEPH LEAHY, a Fellow of the Massachusetts Medical Society, died of pneumonia at his home in Cambridge, December 25, 1915, aged 46 years. He was a graduate of St. Mary's Parochial School and of the Harvard Medical School, in the class of 1892. He was also A.B., Holy Cross, 1888. He is survived by his widow and four children.

DR. A. ALEXANDER SMITH, who died on December 13, was born in 1846. He was for many years professor of medicine in the Bellevue Hospital Medical College and in the combined University and Bellevue Hospital Medical College.

DR. DAVID WILLIAMS CHEEVER died at his home in Boston, December 27, 1915, aged 84 years. He joined the Massachusetts Medical Society in 1858, was recording secretary from 1866 to 1867, and president from 1888 to 1890. He was president of the Boston Medical Library from 1896 to 1906. His name was placed on the retired list of the Massachusetts Medical Society in 1907.

IODEOL—ADVERTISED BY DAVID B. LEVY.

Through an inadvertence, the advertisement of David B. Levy, which appeared on page xiii in the issue of December 30, was printed with the wrong name-plate. The preparation described and recommended in the indications named should have been IODEOL instead of IODAGOL. To prevent any possibility of confusion as to the uses of these two articles, we call attention to the corrected advertisement which appears on page xi of this issue.

The Boston Medical and Surgical Journal

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Original Articles.

GUN-SHOT FRACTURES OF THE EXTREMITIES.

By ROBERT B. GREENOUGH, M.D.; ROBERT B. OSGOOD, M.D., AND BETH VINCENT, M.D., BOSTON.

DURING a three months' service, from April 1 to July 1, 1915, in the University Service of the American Ambulance, at Neuilly-sur-Seine, France, 132 patients, or about one-third of the total number of admissions, presented one or more fractures of the extremities. In 16 cases more than one of the long bones was broken, so that data on 148 fractures are available for study. These cases proved to be among the most interesting and the most difficult cases with which the Service had to deal. There were 129 compound fractures and 19 closed, or simple fractures. Of the 129 compound fractures 8 were incomplete, and the bone was merely grazed or grooved by the bullet, without solution of continuity or abnormal mobility.

Table I indicates the occurrence of fractures in the different bones of the extremities, and shows that the humerus was the bone most frequently involved. The upper extremity as a whole, however, was no more frequently injured than the lower, there being 73 fractures of the upper and 75 of the lower extremity in the entire series.

TABLE I.—FRACTURES OF THE EXTREMITIES.

	Closed.	Compound.	Incomplete.
Clavicle	1	3	
Scapula		5	1
Humerus	3	28	
Arm—both bones		6	
Ulna		6	
Radius	1	2	
Carpus		4	
Metacarpus		4	
Phalanges		9	
Femur	4	17	3
Patella		2	
Leg—both bones	3	11	
Tibia	5	8	3
Fibula	1	7	1
Potts	1	1	
Os calcis		2	
Tarsals		4	
Metatarsus		2	
Toes		2	
	19	121	8

Compound Fractures. The missiles causing compound fractures in this series were for the most part received in trench fighting. There were only 4 injuries due to shrapnel balls; while there were 45 due to fragments of high explosive shells, and 38 to rifle bullets. In 27 cases the nature of the missile could not be determined.

Types of Fracture. Fractures produced by bullets occasionally showed the typical lines of fracture associated with gun-shot injuries, namely, the so-called "butterfly" fracture of the shaft of the long bones, and the "gutter" fracture or "drill" fracture of the softer expanded portions, Fig. 1, 2 and 3. Many of the bullet wounds, and almost all of the fractures produced



FIG. 1.—Typical "butterfly" fracture of tibia, produced by rifle ball.

by shell fragments gave multiple comminuted fractures, with extreme laceration of the soft parts between the wounds of entrance and of exit. In the shell wounds this was attributed to the irregular shape of the fragments; in the bullet wounds it was attributed to the so-called explosive effect of the modern rifle bullet at short ranges, such as obtain in the modern trench fighting and assault. Fig. 4.

Infection. There were only three of the 121 compound fractures in which aseptic healing of the wounds of entrance and exit occurred. These



FIG. 2.—Compound fracture of ulna, produced by rifle ball. Typical "butterfly" fracture.



FIG. 3.—"Drill" fracture of lower end of tibia.

cases were: (1) A fracture of the neck of the femur, (2) a fracture of the fibula, (3) a fracture of a single phalanx. In all of the other cases a certain amount of sepsis was present. Cultures were obtained from many of the most gravely infected wounds, and out of 132 cultures taken on 100 different cases, 28 showed gas-producing organisms not to be distinguished from the *Bacillus Aerogenes Capsulatus*. When the bacillus was not present the ordinary pus-producing organisms were obtained. All of

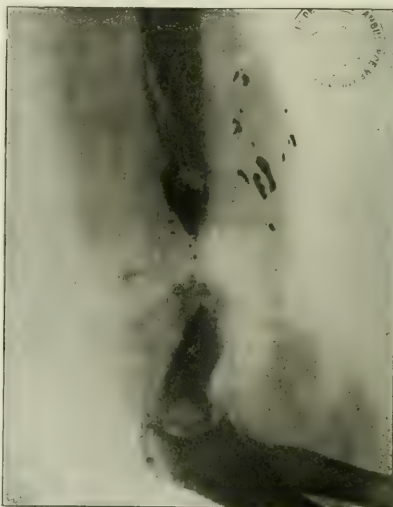


FIG. 4.—Extensive comminuted fracture of humerus by shell fragment, with great loss of substance. Shell fragments remaining in tissue.

these cases received a first-aid dressing with iodine, and an inoculation of tetanus antitoxin, at the front. They then came back through one or more evacuation hospitals and reached the American Ambulance from twenty-four to seventy-two hours, as a rule, after the receipt of injury. Occasionally cases were received which had been for longer periods at hospitals nearer the front.

Infection of the wounds at entrance was so much the rule that the routine treatment of the case was directed especially toward overcoming this infection. It was attributed especially to contamination of the wound at the time of entrance of the missile, or immediately after, and it was believed that this contamination came chiefly from the clothing of the soldier. Wounds produced by shell fragments were as a rule more seriously contaminated than those made by bullets. In many cases fragments of the soldier's clothing were carried bodily into the wound and deposited deep in the tissues. These fragments of clothing in many cases gave a culture of the gas-bacillus, and a continuance of the infectious process was to be expected until these fragments were sought for and removed. A series of cultures taken from soldiers' clothing showed in many instances the presence of the gas-bacillus in the clothing. In one of the pathological specimens brought back from Paris a piece of the soldier's uniform lies in the middle of a "drill" fracture of the head of the tibia. This was a case which came to amputation on one of the other services at the hospital.

Treatment. The use of first-aid dressings with iodine, and the injection of tetanus antitoxin at the front line dressing stations has been alluded to. These first-aid dressings were commonly applied directly to the skin by cutting away the clothing over the part; the clothing over the rest of the body was not removed, and



FIG. 5.—Types of wire gauze splints supplied to the French dressing stations at the front.

the extremity was usually immobilized in a tin or aluminum splint with cotton padding, for the journey to the base hospital, Fig. 5, 6 and 7.

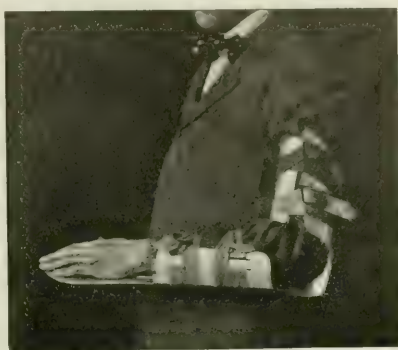


FIG. 6.—Folding aluminum arm splint.

On entrance to the hospital these patients were examined, and in practically every case ordered to the operating room, where under gas-oxygen, ether or chloroform anesthesia, the part was shaved, dried, painted with iodine, and the wounds of entrance and (if there were one) of exit enlarged and explored. In many cases, especially when the missile lodged, an x-ray plate or fluoroscopic examination was obtained before operation.

In cleaning up these wounds an effort was made to find and remove foreign bodies of any

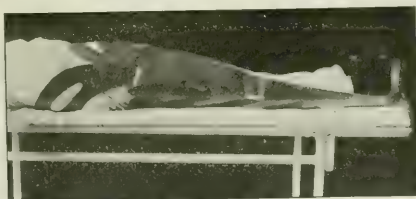


FIG. 7.—Folding aluminum splint for leg and thigh.

sort, whether missiles, clothing, gross dirt, hair, or other matter. In many cases fragmentation of a bullet by rupture of its jacket produced so many minute particles of foreign material that complete removal was an impossibility, Fig. 8. When serious comminution of the bone was present, especially when the particles of the bone had been driven as secondary missiles into the surrounding tissues, and had been detached from the periosteum, these bone fragments were also removed. Where bone splinters, by their anatomical situation, threatened erosion of the large vessels, they were also removed. Devitalized tissues, especially skin and muscle, were excised.

Irrigation was employed in many cases, either salt solution, weak iodine solution or sodium

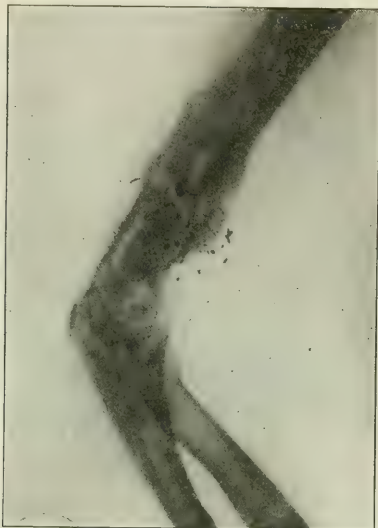


FIG. 8.—Compound comminuted fracture of humerus by shell fragment. Multiple foreign bodies left in. Good union.

hypochlorite (1:200). The last was found to be a very satisfactory solution for irrigation both at operation and in after-treatment.

Drainage was employed in practically every case. For this purpose rubber tissue or "protective" was found to be most satisfactory. Thin sheets of "protective" could be laid between the muscle planes, and gave less danger of ero-

sion of vessels, etc., than did more rigid rubber tubing. After the wound had been satisfactorily cleaned and drained, a rigid dressing for immobilization was applied, with the patient still under the anesthetic. In the leg and thigh fractures this was greatly facilitated by the use of the "Maddox" extension table, whereby extension could be maintained during the application of a plaster dressing, Fig. 9.

Wood and metal splints were used in certain cases, especially at the beginning of our service, Fig. 10. As time went on, however, plaster dressing reinforced with bridges of wire gauze or iron were more universally employed, and the problem of satisfactory fixation of these cases seemed to have been solved, Fig. 11, 12, 13, 14 and 15.

After-treatment. Immediately following operation and cleaning up of a fracture, a marked rise in temperature and pulse ordinarily took place. By the second or third day, however, the majority of cases showed a normal temperature and had very little discomfort. Wounds were dressed at intervals of from six to twenty-four hours. The most septic cases had wet dressings applied at frequent intervals, or were put upon constant irrigation, the solution of sodium hypochlorite being most commonly used. By means of the "basket" plaster constant irrigation could be carried on without getting the plaster wet. Drainage wicks were changed at frequent intervals, and this could be done without much pain by the use of "protective" tissue. It was our belief that the very constant and devoted supervision of these cases after operation, by the house-officers on the Service, was responsible very largely for the rapid subsidence of infec-

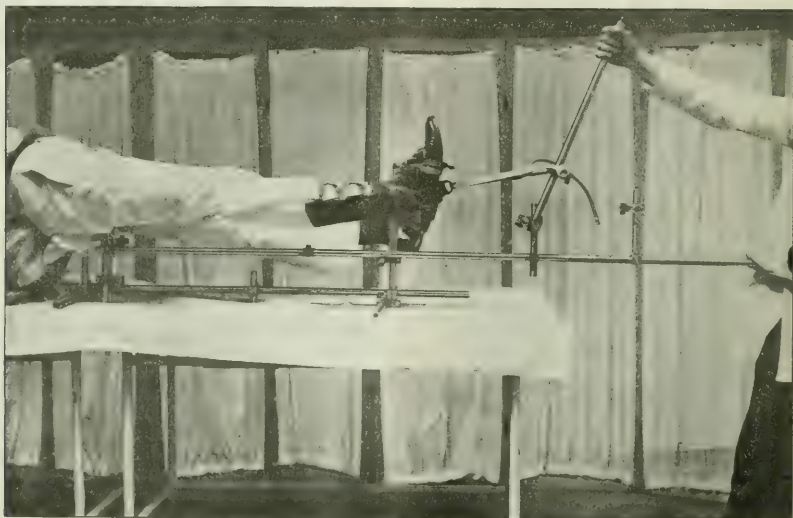


FIG. 9.—"Maddox" extension table for the application of plasters in extension.

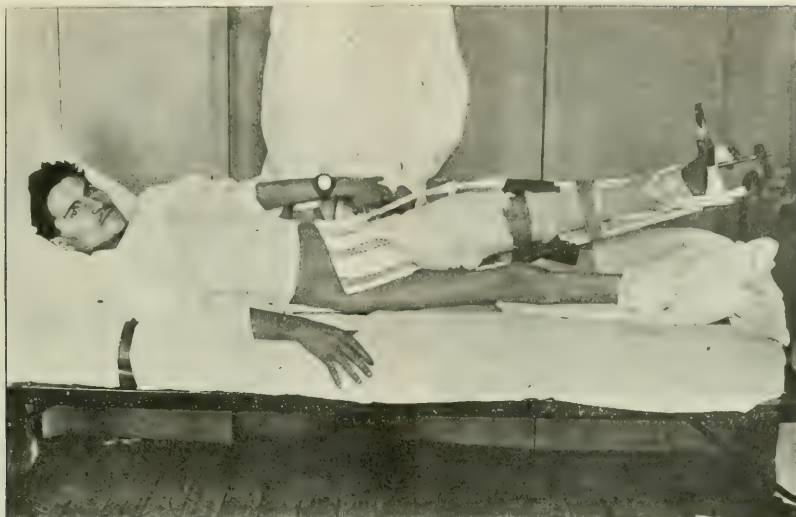


FIG. 10.—Osgood's modification of Thomas' hip splint with extension and foot-rest, for compound thigh fractures.

tion. Occasionally a plaster dressing would have to be split, or even a new one applied, because of swelling. More often, however, the plaster could be retained until diminution of swelling made necessary a new plaster to obtain sufficient immobilization.

There was one death in the entire series of cases, due to a gas-bacillus septicaemia. This was a case of compound fracture, by shell wound, of the right humerus, with injury to the brachial artery. At entrance there was gangrene of the arm, and spreading gas-bacillus infection of the shoulder and the tissues of the chest wall. Amputation was done immediately, and wide incisions were made in the infected tissues. No further local extension took place, but the patient died on the sixth day with gas-bacillus septicaemia.

There were 5 cases of amputation of a finger for a compound fracture of a phalanx, and there were 13 cases in which amputation of the upper or lower extremity was necessary. Five of these amputations were done at the front before the patient came to the American Ambulance; two were amputated on the University Service before the Harvard Unit came on duty, and six amputations were performed on the Harvard Service. Indications for amputation in the six cases were as follows: For secondary hemorrhage, 2 cases—1 arm, 1 leg; for gas-bacillus infection and gangrene, 1 case—the fatal case above referred to; for sepsis of the knee or ankle joints, 3 cases. Five of the six cases recovered.

Time sufficient for solid union of many of these fractures had not elapsed when our Service finished on July 1. Fifty-seven of the 132 pa-

tients, however, had been discharged from the hospital within that time.

COMPLICATIONS.

Sepsis. The complication most to be feared in these cases was, undoubtedly, continued sepsis. Infections with gas-producing organisms were not unusual, but rarely failed to yield to open incision, drainage and irrigation. An anti-gas-bacillus serum was prepared by Dr. Weinberg of the Pasteur Institute, and was used in certain cases in the hospital. As other methods of treatment were also employed simultaneously, it was difficult to determine the value of the serum.

Many cases showed gas bubbles, crepitation and the characteristic odor and appearance of gas infection at entrance, but in only one case was amputation necessary for this condition, and in that case an injury to the brachial artery was the principal determining cause of the gangrene of the extremity. That patient died of a gas-bacillus septicaemia. Other cases showed gas infection at entrance, but as the case progressed the signs of gas-bacillus disappeared, and the ordinary pus organisms alone were present. In two such cases amputation was subsequently necessary, where the sepsis involved the knee joint. In another case complete disorganization of the ankle joint, and a mixed infection made advisable an immediate amputation.

Hemorrhage. Secondary hemorrhage is a serious and not unusual complication of gun-shot fractures. The proximity of the main vessels to the long bones and the ease with which they may be wounded by the missile, by sharp fragments



FIG. 11



FIG. 13



FIG. 12

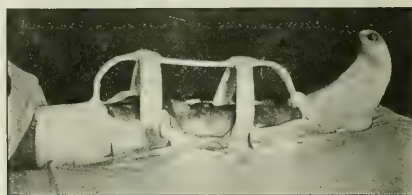


FIG. 14



FIG. 15

FIGS. 11, 12, 13, 14, 15.—Types of reinforced plaster of Paris splint for compound fractures. Bridges of wire gauze used to strengthen the dressing where windows are cut to permit dressing wounds.

of bone, or by erosion of advancing sepsis, made this possibility one ever to be borne in mind. Two cases of secondary hemorrhage occurred in 121 compound fractures, one from the anterior tibial and one from the brachial artery. Both required ligature and amputation, and in one a transfusion was necessary on account of the loss of blood. Tourniquets were kept at the bedside of the more gravely infected cases, and plaster dressings were arranged with a view to permit the application of the tourniquet in case of need. As a result of observation of our own and other cases in the hospital, we came to believe that free incision and drainage, removal of sharp bone fragments, and the best possible immobilization of the ends of the bones were the three most important conditions to be observed in the avoidance of secondary hemorrhage.

Necrosis. Where sepsis was continued for a considerable period of time, even if of low grade, bone fragments became devitalized and were sequestered. In such cases secondary operations were sometimes necessary for the removal of sequestra. In one case the fragmented head of the humerus was sequestered in this way, in such a fashion to produce, as it were, a spontaneous resection of the shoulder joint, Fig. 16. In four of the eight fractures involving the head of the humerus, secondary excision of the head of the bone was necessary, and in two of the three compound fractures of the neck of the femur, excision of the head of the femur was performed, Fig. 17 and 18.

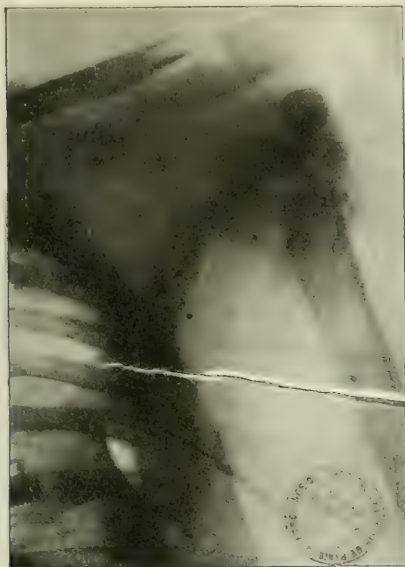


FIG. 16.—Compound fracture of humerus by shell fragment. Spontaneous sequestration of bone fragments removed by operation.

Delayed Union and Non-union. This was a complication or sequel to be feared in all of the compound fractures. Where a considerable loss of bone substance was sustained by the passage of the missile, or was made necessary by operation, a delay in healing was to be expected. In the cases of continued sepsis and necrosis also, a



FIG. 17.—Compound fracture neck of right femur by shell fragment. Operative excision of head of femur.

prolonged convalescence was to be expected. One could not fail to be impressed with the extraordinary reparative power of bone in young and healthy patients such as the French soldiers. In cases of delayed union conditions favorable for operative fixation by plates or bone grafts could not be obtained until the sinuses were closed. We found but one case suitable for such procedure. (See "closed fractures").

Ankylosis and Contractures. Nerve Lesions. Following long fixation of joints and lack of use, it was to be expected that many cases of ankylosis and contracture would occur. There was abundant material for orthopedic treatment, both in old cases, to remedy existing deformities, and in more recent cases to prevent their occurrence. In this connection the frequent involvement of such nerves as the musculo-spiral and the external popliteal must be borne in mind,



FIG. 18.—Compound fracture of neck of femur, by rifle ball. Operative excision of head of femur.

with their accompanying wrist and toe drops, for which special retaining and correcting splints were devised. These and other peripheral nerve lesions will form a subject of a special report by Drs. Cushing and Cutler. Use was made of steel calipers inset in plaster dressings, in order to provide knee motion in thigh and hip fractures in certain cases.

Closed Fractures. There were 16 cases of closed or simple fractures of the long bones, which were produced by causes other than perforating missiles. These were not materially different from fractures occurring in civil life. There were also 3 cases which were closed fractures when transferred to us, which had been previously compound fractures produced by missiles. There were 5 fractures of the tibia, 4 of the femur, 3 of both bones of the leg, and 3 of the humerus. In 14 of these cases fixation by splints or plaster was sufficient. Five cases came to operation,



FIG. 19.—Simple fracture of femur, healed in deformity. Reduced by open incision and bone plates.

Two fractures of the femur were cut down upon, extension applied and bone plates used to hold the ends in apposition. Both were old cases, healed in deformity. In one of these the plate loosened and a partial recurrence of the deformity took place. The other was a perfectly satisfactory result, Fig. 19. In three cases of oblique fracture of the tibia, operation was done—two

were fixed with Parham bands, Figs. 20 and 21, and the other with a bone plate. All of the five



FIGS. 20 AND 21.—Closed spiral fracture of tibia. Open reduction and fixation with Parham bands.

cases healed by first intention, and the plates or bands were not removed.

SUMMARY.

Early and thorough operative treatment is indicated in gun-shot fractures received under the conditions of trench warfare.

The removal of missiles, foreign bodies, and detached bone fragments, and thorough drainage are important.

Complete immobilization in extension is as a rule best obtained in a base hospital by plaster dressings, put on under an anesthetic.

Frequent and painstaking dressings, with or without irrigation, and the maintenance of free drainage are of great importance in overcoming sepsis.

Prophylaxis is better than corrective treatment in the avoidance of ankylosis of joints, and contractures of muscles and tendons.

SIMULATION OF ESOPHAGEAL STENOSIS BY EXTENSIVE CARCINOSIS OF THE LESSER CURVATURE OF THE STOMACH.

By A. EVERETT AUSTIN, M.D., BOSTON,

Physician to Mt. Sinai Hospital and Berkeley Infirmary; Assistant to Boston Dispensary.

IN the classic description of a typical esophageal stenosis, the symptoms are always described

with such accuracy that it would appear that there would be no difficulty in diagnosing such a form of disease. This description runs about as follows: There is difficulty in swallowing, which begins either instantly or comes on gradually, increasing steadily with the continuance of the disorder. At first only solid particles pass with difficulty, and many authors note that fat meat, for instance, can be swallowed much more readily than lean; finally, only liquids can be ingested, and, at last, even these, only when taken in very small quantities.

Unless taken with these precautions, the greater portion is either immediately regurgitated or it remains some time in the esophagus and is then at a later period, without reference to taking of food, regurgitated in a decomposed condition, mixed with a large amount of mucus. Under these conditions, the described patients emaciate rapidly.

In other cases the passage of food into the stomach is only temporarily restricted, or an entire meal may be taken with ease, while others cannot pass the obstruction; this is explained by cardiospasm or by the presence of diverticulum. Very often the patients complain of pain while swallowing, which may be either localized under the sternum or may extend along the entire esophagus.

The patients rarely describe this ejection of food as vomiting, because it comes in small quantities, but speak rather of eructations of food. The peculiarity of this material which is ejected is that it is either just as taken, or is decomposed or fermented with a sour yeasty odor, but never contains hydrochloric acid.

The former description, of course, differs emphatically from the ordinary description of cancer of the body or pylorus of the stomach, in which the pain is situated farther down and is more of a paroxysmal character; the ejection of food, too, is more periodical, and in much larger quantities, containing more often digested blood, which gives it its peculiar coffee-ground appearance.

When a mass can be discovered in the abdomen, diagnosis is fairly well assured, but the cachexia in gastric carcinoma is not necessarily any greater than that of esophageal.

Now experience has taught me, as well as others, that there are forms of carcinosis of the stomach which are not so clearly defined as those of which the classic symptoms have been given; in other words, they lie upon the border line between these two forms, and often require a great deal of ingenuity in order to differentiate them. Take, for instance, the vomitus or the material regurgitated: both are usually free from hydrochloric acid and are in more or less of a state of fermentation, in which the lactic acid predominates.

True, Boas-Oppler bacilli are never found in the former, but blood may be present in both, though generally when coming from the esophagus, it is bright red, and not dark brown.

The stomach tube, too, though of great aid, sometimes fails to inform us which condition is present. It may show no beginning of narrowing of the esophagus, at one period, when the patient shows little or no evidence of cachexia, and, as has been my experience, four months later fail to pass when the patient exhibited all the evidences of advanced malignant disease. Then, too, the tube will meet obstruction at a point beyond which it should go through the cardia (45 cm.), and leave one in doubt whether he is in a diverticulum, or has run against obstruction on the gastric side of the cardia, due undoubtedly to excretion of a malignant growth, which obstructs the further passage of the tube. Even the x-ray has not proven absolutely reliable in diagnosing these respective conditions. In two instances, at least, which will be described more fully, in the case histories to follow, bismuth remnants have been found in the esophagus 30 minutes after it was taken, and yet, operation showed an extensive infiltrating carcinosis of the lesser curvature, instead of one in the esophagus.

Furthermore, in very small contracted stomachs, also produced by carcinoma, not situated at the pylorus, the bismuth, or rather the solution in which it is given, completely fills the diminutive stomach and leaves a portion in the esophagus.

The deglutition sounds in my hands have proven very unsatisfactory. Unless in a prone position, the second sound very often fails to be delayed or even missed, apparently on account of the rapid passage of the water from the pharynx to the stomach. As these sounds are not always clearly distinguished in the perfectly normal individual, it can be plainly seen that their absence is not of very great significance in detecting the presence of stenosis. In true stenosis, however, patients complain more often of a feeling of obstruction in the gullet much lower than that experienced in the well known globus hystericus, which is located more particularly by the patient in the throat. In addition, this true sensation of obstruction, due to real stenosis, can often be overcome by the patient's drinking large quantities of water, while the former is unaffected by such treatment.

Blood upon the end of the stomach tube or sound, when withdrawn, is of course never found except in cases of ulceration or of a malignant growth, and according to my experience, is not nearly so common as we would be led to understand. When found, it is vastly more significant of esophageal growth.

The majority of patients complain of regurgitations of glairy mucus, not unlike the condition known as waterbrash, but the fluid is much less in quantity and thicker. This regurgitated material seldom contains food particles and is rarely blood-stained, unless a diverticulum has been formed above the constriction.

Hoarseness and aphonia, when present, are due to pressure of the growth upon the recur-

ient laryngeal nerve, and while in my experience are rarely found, are very suggestive of the presence of an esophageal growth.

As to the esophagoscope, I have had little or no experience; one of my patients, however, had a perforation of the bronchus, produced by this instrument, in the hands of a very skilled and experienced operator. Outside of an annoying cough and bloody expectoration for several days, no harm seemed to arise, and the man lived for six months. In illustration of these difficulties of diagnosis, the following cases are reported.

CASE 1. D. M., male, 54 years of age, teamster.

He had been a vigorous, active man and never sick until eight months previous to the date of examination. His illness began at that time, with eructations of gas and fluid on rising; the taste was sometimes bitter and sometimes sour. Being employed by a brewery, he had been accustomed to drink from ten to twelve glasses of beer daily.

At present he has lost 35 pounds; has pain after eating, which persists for two or three minutes; swallows easily, if warm food is taken, but regurgitates cold articles of food. He sleeps well at night; his bowels move only with laxatives, and he has a slight burning in the epigastrium when the stomach is empty.

Physical examination showed a man distinctly cachectic but he had no jaundice. Two hours after a meal of noodle soup, potato and meat, the introduced tube met with obstruction and could not be passed in three attempts. The end of the tube was covered with a glairy mucus, which showed no reaction for hydrochloric acid and there were no blood stains. The stomach extended one finger's breadth below the navel, which lower border could be easily seen; there was no succussion and no enlarged glands either in the supraclavicular region or in Douglas's pouch. No mass could be felt. The liver was not enlarged or nodular. The urine was high-colored, contained no albumin or sugar and no bile, but gave an excessive Ehrlich aldehyde reaction.

On a second attempt made two days later, the tube brought up 50 c.c. of sour smelling gastric contents without free hydrochloric acid and with marked lactic acid reaction. There were many long bacilli. The x-ray showed a much enlarged and prolapsed stomach, extending below the iliac crests with twenty-four hours' residue.

Based largely on the x-ray findings, a laparotomy was performed by Dr. Brewster, who found a large malignant mass, extending along the lesser curvature and involving the cardia, but not the pylorus. A jejunostomy was done, but death occurred six days later.

In this case special reference must be made to the difficulty of deglutition. This was apparently one of the earlier symptoms, and one to which the patient's attention was first called.

This, as can be readily seen, was not absolute, but occurred only at times, and as the patient noted, usually much less serious when warm food was taken than when cold articles of food were eaten.

The obstruction offered to the passage of the soft tube was also periodic and rather unex-

plainable. That a tube should pass at one time, and meet with complete resistance at another, can, of course, be due only to complicating spasm of the cardia. The point of obstruction, can, of course, not be readily determined by means of the soft tube, and where one suspects malignant disease, there is some hesitation in the employment of the hard sound; still the inference can usually be drawn that the obstruction in such cases as these, is at or near the cardia.

In this case, too, as can be noted, no blood was produced by the introduction of the tube against the growth. A residue, shown by the x-ray examination, twenty-four hours after the ingestion of the bismuth is extremely rare, particularly when operation showed that there was no involvement of the pylorus.

The question may also arise in such circumstances as these, whether one is really within the stomach itself, or is in a pouch. The answer to this question can usually be determined by the presence of rennin, which is, of course, a feature of gastric secretion, and usually persists in the cancerous stomach, long after the hydrochloric acid is eliminated.

CASE 2. Mrs. G. D., female, 47 years of age, housewife. In the family history there was nothing significant. The patient had always been well to four years ago, when she had had recurrent attacks of diarrhea without pain. After a long period she had been restored to health.

After a short summer vacation, six weeks ago, the patient began to experience pain in the precordium and to regurgitate small quantities of food almost immediately after it was taken; in the words of the patient, she ate a few mouthfuls, which were ejected in less than five minutes, and then she could partake of a fairly large quantity, which would remain. There was no taste to the matter ejected, or rather, the taste did not differ from that of the food. Her bowels had been confined, and she had now been in bed three weeks, with poor appetite, and steadily increasing weakness.

On physical examination she was found to be very anemic, with a tongue which was clean but denuded of epithelium along the borders; her teeth were excellent; all reflexes were retained. A small soft supraclavicular gland was discovered at the base of the larynx on the left side. The heart and lungs were without significance. The abdomen was full. The outline of the lower border of the stomach was distinctly seen, which moved on respiration, extending nearly to the navel. This lower border could be distinctly felt, having the feeling of upholstery.

The area to the right of the median line was very much enlarged; there was no succussion. The right rectus was in a state of spasm, but no mass could be felt. The liver was not enlarged, but its area was encroached upon by the enlarged right stomach. No fluid could be discovered in the abdomen, but by personal information from the physician in charge, Dr. E. E. Hamblen, it was learned that it later accumulated.

The stomach tube met with resistance at about the level of the cardia and could not be introduced. The vomitus or regurgitated matter contained no free hydrochloric acid, but had a total acidity of thirteen. Long bacilli were detected in scanty

numbers. The urine was high-colored, contained abundant urates, a trace of albumin and increased urobilin, which was indicated by the very marked Ehrlich aldehyde reaction, and a trace of bile pigment. Hyaline (plain) and granular casts were present in large numbers, but there was no blood.

The x-ray showed no food in the stomach, but what bismuth was swallowed remained in the esophagus. An illy defined mass at the cardia was made out.

The patient was operated upon one month later by Dr. Daniel Jones, who found a malignant growth in the lesser curvature of the stomach, extending to and involving the cardia (verbal communication); a jejunostomy was done, but the patient died three days later.

Two noticeable peculiarities in this case were: first, the short duration; and secondly, the apparent absence of great emaciation. Here, too, though the symptoms pointed to the esophagus, rather than to the stomach, an inference which was apparently substantiated by the difficulty in the introduction of the stomach tube and the peculiarity of the regurgitation, the enlarged supraclavicular glands might mean malignant disease of either the esophagus or the stomach; the tense well defined gastric borders pointed to the latter.

The evidences of obstruction to the return of the blood to the right heart, shown in the passive congestion of the kidney, and the urobilin and bile pigment indicated a more or less extensive involvement of the subperitoneal glands. A peculiar feature was also found in the inability of the bismuth and buttermilk to pass through the constriction at the cardia, since in all other cases this occurred in sufficient amounts to enable the stomach to be fully portrayed.

In looking over the literature on the subject, two more cases were found, which on account of their similarity to those already described, I venture to again report.

(1) CASE 3. H. G., male, 64 years of age.

Previously in good health, he began to experience after bodily exercise, severe pain in the left thorax, which was at first diagnosed as intercostal neuralgia. The pain was at first periodical, but later became more intense and of longer duration; emaciation soon followed.

Upon examination, it was found that the soft stomach tube met with obstruction at the level of the cardia, but with some delay overcame this and entered the stomach. There was absolute absence of free hydrochloric acid, with distinct diminution of the total acidity. The fasting stomach was always free from food remnants.

On account of the refusal of the patient, no operative intervention was undertaken. The subsequent history of the patient, which consisted in the development of severe vomiting, icterus and metastatic malignant masses in the liver, confirmed the previous diagnosis of cancer of the lesser curvature, involving the cardia. Death soon followed, but no autopsy was allowed.

A second instance of this peculiarity was also found, reported by Dr. W. Bauermeister.

(2) CASE 4. A. B., male, 56 years of age, carpenter.

He was always well up to six months ago. Then he began to have under the sternum, a feeling of pressure and found that often a solid article of food apparently met with obstruction, so that he had to cease momentarily from eating, and take a large swallow of some fluid, which removed this unpleasant sensation. He experienced also, at times, regurgitation, by which fluids were brought up, but never solid remnants. During the act of eating, too, an occasional mouthful returned, which compelled him to cease with his meal for a short time. During this period, however, he had lost about 20 pounds in weight.

The patient was extremely anemic, his nutrition well maintained, while under the left costal border, some resistance could be felt. The tube was introduced without difficulty, removing 240 c.c. of fairly well digested contents, with acidities of 18 and 45.

It was noted that the first portion which flowed through the soft stomach tube was stained with blood and also the last. His condition continued to deteriorate, until six months later, he was unable to take anything but milk and raw eggs, and there was extensive regurgitation of mucus from the esophagus. At this time, neither the soft tube, nor a sound of any diameter could be introduced beyond 39 cm. from the upper teeth, but there was never blood upon the instrument. The introduction of the esophagoscope showed no growth in the gullet, but a thickening of such a character that the instrument remained at a depth of 34 cm., beyond which a deeply edematous condition of the mucous membrane could be discovered.

Ten days later the patient died, and the autopsy showed a broad, superficial, ulcerating carcinoma of the lesser curvature that ceased 1½ cm. before reaching the true cardia. The obstruction was due to extensive edema which had extended up the esophagus to within 37 cm. of the teeth.

The author's conclusions are, that the actual cause of the obstruction, which has been noted in two of my own cases, is not due to cardiospasm, nor to true malignant stenosis, but is due to this edema, wherever there is a widespread carcinosis of the lesser curvature, which approaches the cardia.

The practical importance of this difference of diagnosis, of course, is not great. In either case, there is left the patient only a serious operation—that of gastrostomy—to keep him from starvation, when the obstruction has become so great that no food can pass through the constriction. We should be much less ready, however, to perform operations, if we were assured that a general carcinosis of the stomach existed.

A divulsion, too, when carcinoma exists is always attended with much danger of perforation and even the newer method of distention, by means of a ball filled with air, is not without its peril. Still, there is always a personal satisfaction in reaching a correct diagnosis, and in summing up, we may say that when we come across symptoms of dysphagia, relieved by water

drinking, with inability to pass a soft tube, or difficulty in its passage at a point near the cardia, with eructations of food without hydrochloric acid and with rennin present, without a tumor in the abdomen but rigidity of the gastric borders, we are not to decide at once that we are dealing with esophageal stenosis, but sometimes with general carcinosis of the stomach.

Naturally, we must restrict this statement to those ages at which cancer is common, but we cannot absolutely exclude such a diagnosis during the earlier period of life, since such instances of carcinoma as early as forty years of age have been observed by me and by others. There is, of course, a possibility of syphilis of the esophagus and stomach, but with the negative Wassermann test such can be readily excluded. As in a long continued dysphagia, existing in one instance under my observation, according to the patient, for twenty years, our conclusion must be at once that it is not malignant, and is due to spasmodic constriction, or to a diverticulum.

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Dr. W. Bauermeister: Zur Semiologie des oesophagoskopischen Bildes. Archiv für Verdauungs-Krankheiten, 16, 520-522.

A NOTE ON THE SIMULATION OF DIABETES MELLITUS.

BY GEORGE BLUMER, M.D., NEW HAVEN, CONN.

THE simulation of diabetes mellitus is probably not of very frequent occurrence. The textbooks almost ignore the subject; special treatises on diabetes frequently fail to mention it; and even works on the simulation of disease discuss it in a somewhat casual and fragmentary way. The matter is, however, not without interest both from a casuistic and a medico-legal viewpoint. A case recently seen illustrates certain points of interest, particularly the fact that the fraud may not be so obvious at first sight as might be suspected.

The patient, Mrs. X., was an Irish American, 33 years of age, who was sent to me by a physician in a neighboring town for a pruritus of the vulva.

The patient's family history was entirely negative. Her parents and her brothers and sisters were all alive and well, and there was no history of nervous or mental disease in the family.

As a child the patient had had measles, whooping cough, chicken-pox, mumps, tonsillitis, and scarlatina. There were no complications with any of these diseases. She had had no serious disease as an adult. An ovarian cyst, and incidentally the appendix, was removed six years ago. The menstrual history was normal. The patient married at twenty-four and had one miscarriage at two months, four months before consulting me. There was no vene-

real history. The patient had always been a good eater, fond of meat, sweets, and candy. She was not on a special diet at the time she consulted me.

The patient dated the pruritus vulvae from a period twenty months before I saw her. It had appeared rather suddenly, and had been present since that time. It varied in intensity, and tended to be worse at night. It was severe enough at times to interfere with sleep. Urination increased the pruritus. There was no increase in the output of urine. The patient stated that she felt weak, but thought this due to loss of sleep. She had lost twenty pounds in the preceding nine months. There was no general pruritus. The appetite was not abnormal. The patient was very thirsty at times; at other times she "despised" water. She stated that occasionally she had severe frontal headaches with anorexia and even slight nausea. With these her face was flushed. She was more nervous than usual and tended to be constipated.

The physical examination was almost negative. The patient was overnourished and had an excellent color. Her tongue was clean. Her pulse was small and regular and normal in rate. Her blood pressure was 120 systolic and 80 diastolic. The thyroid was normal and there were no glandular enlargements. The lungs were clear. The heart was negative except for a rather short, moderately harsh systolic murmur over the aortic cartilage. The abdomen was negative. The liver and spleen were not enlarged. The kidneys were not palpable. There was no edema of the shins. The pupillary and tendon reflexes were lively. No mammary or ovarian tenderness was present. No sensory changes could be detected.

The patient brought with her a single specimen of urine, stating that her urine had been tested before and that sugar had been reported by at least two physicians. The specimen presented was light amber in color, hazy, acid in reaction, had a specific gravity of 1.057, was free from albumen, and gave a very slight reaction for sugar with Fehling's solution. With Benedict's solution the copper was reduced in an amount that was estimated as representing about 0.25% of sugar. The polariscope showed 8.5% of a dextro-rotary substance.

The patient was requested to send a twenty-four hour specimen of urine and was instructed how to collect it. On its arrival the amount was 650 cubic centimeters; it was slightly cloudy, acid in reaction, and had a specific gravity of 1.060. The urine contained the faintest possible trace of albumen, no acetone, no diacetic acid and no indican. Tests for sugar showed a negative reaction with Benedict's solution and Nylander's solution. The polariscope showed 11.25% of a dextro-rotary substance. After inversion by heat and acid, copper was reduced and the polariscope showed 3.9% of a laevo-rotary substance. Rotating substances other than sugars having been excluded, it was clear that the substance originally present in the urine was sucrose, and that inversion had transformed it into dextrose and levulose, the latter preponderating and causing the laevo rotation. Professor Lafayette Mendel was kind enough to examine the specimen and to confirm the diagnosis of sucrosuria.

The patient's physician was communicated with and informed of the findings. On account of the local symptoms he was able to suggest a bladder examination and to obtain a catheterized specimen of urine. This specimen when examined in the lab-

oratory here was absolutely free from sugar of any kind, as were subsequent specimens obtained by catheterization and examined by the patient's family physician.

It was evident then that the patient was not suffering from diabetes mellitus, but that she had purposely added sucrose to the urine in order to simulate this disease. The psychology underlying this deliberate deceit was not perfectly clear. The patient was not hysterical in the strict sense of the term and did not show the physical manifestations of hysteria. She was distinctly neurotic, and according to her family physician had been known on one previous occasion to feign illness in order to compass certain aims in connection with her family life. This was probably the explanation of the simulated diabetes, though the family physician could not discover what particular object the patient had in view.

The simulation of diabetes probably dates back to an early period in the popular knowledge of the disease. Heller cites cases in 1858 (*Oester. Zeit. f. Prakt. Heilkunde*, 1858, vol. iv, pp. 419 and 481) and states that the laity were acquainted with the disease at that time. It is probable that in German-speaking countries widespread popular knowledge of the urinary changes was developed earlier than in other countries on account of the popular name "zuckerkrankheit."

The simulation of the disease may take three forms: (1) the addition to the urine of sucrose; (2) the addition to the urine of glucose; and (3) the production of an artificial glycosuria by the consumption of phloridzin or phloroglucin. The last named form of simulation is suggested by Stier as a possibility though he cites no actual cases (Stier in Becker, *Die Simulation von Krankheiten*, Leipzig, Thieme, 1908).

Simulation of diabetes mellitus is easier than that of many other diseases because of the lack of objective physical phenomena in mild and uncomplicated cases, and because the urine in such cases presents no characteristic chemical abnormalities aside from the presence of sugar. The detection of sucrosuria is simple if certain precautions in the care of the urine are observed. Failure to observe these is what has led to failure to detect the imposture. If the urine is allowed to stand after collection, especially if in a warm place, inversion of the sucrose into dextrose and levulose may occur either as the result of bacterial action or even apart from this. In such a case reduction of copper will occur and will throw the physician off his guard, unless he happens to note the great disparity between the degree of copper reduction and the specific gravity of the urine. In the extraordinary case of Abeles and Hoffman (*Wiener Med. Presse*, 1876, vol. xvii, pp. 1507 and 1537) and in our case such inversion did take place, and in both instances misled some of the physicians who tested the urine.

Where the patient is unusually intelligent and well informed, glucose is added to the urine

and detection of the fraud becomes difficult, especially if there is nothing to arouse the suspicion of the physician. A patient who is intelligent enough to add glucose to the urine has usually read up the subject in an encyclopedia or text-book and may not only give a typical history, but may even add water to the urine with the sugar in order to simulate the polyuria and do away with the disparity between sugar content and color and quantity of urine which might put the observer on his guard. Stier cites one case where a well educated man under accusation for certain moral delinquencies actually did this. In Abeles and Hoffman's Karlsbad patient sucrose was first added to the urine, but the patient returned to them the following year with glycosuria and actually introduced the glucose into her bladder so that catheterized specimens obtained at periods named by her showed a saccharine urine. Most simulators are not so intelligent as this and are apt to make the mistake of adding too much glucose so that such an unusual urinary picture is produced that suspicion is aroused.

The detection of the simulation depends in the first place on the occurrence of some factor which arouses suspicion in the mind of the physician. In soldiers or in cases with a medico-legal bearing this suspicion is much more likely to be aroused than it is in cases occurring in ordinary civil practice. The detection of sucrosuria is, as stated, simple if the urine is examined fresh. In this case there is no inversion of the sucrose and no copper reduction, and we have a high specific gravity urine with large amounts of dextro-rotary sugar shown by the polariscope, which on artificial inversion splits to dextrose and levulose. Even where some spontaneous inversion has occurred the tremendous disproportion between the copper reduction and the specific gravity should at once cause suspicion; also the fact that there is no increase in the amount of urine and that the color is high. The simulation is, of course, confirmed by the examination of urine passed by the male patient in the presence of the examiner or obtained by catheterization from female patients—preferably after washing out the bladder with saline solution.

The detection of simulated glycosuria is more difficult if the patient is intelligent enough not to put in too much glucose. Formerly, commercial glucose was not chemically pure and contained sugar intermediate between dextrin and dextrose. This sugar showed much higher polariscope readings than it did copper reduction and could be detected by this means, as Abeles and Hoffmann showed in their case. This is still the case with some commercial glucose, but would not be the case if the patient used a chemically pure product. When suspicion is aroused, however, catheterized specimens will clear up the case; though, in view of the experience of Abeles and Hoffman, even these must be

obtained when the patient does not suspect their purport.

If there is suspicion that an artificial diabetes is being produced by the consumption of phloridzin or phloroglucin the isolation of the patient away from possible supplies of the drugs in question would seem to be the only rational procedure.

NOTES OF A CONFERENCE ON THE MEDICAL AND SOCIAL ASPECTS OF SYPHILIS OF THE NERVOUS SYSTEM.

HELD AT THE PSYCHOPATHIC HOSPITAL,
MAY 27, 1915.

(Series continued from page 15).

IX.

THE DEVELOPMENT OF THE GOLD SOL "PARETIC" REACTION AS COMPARED WITH THE "CEREBROSPINAL SYPHILITIC" TYPE, CONSIDERED FROM THE TIME NECESSARY TO FORM A COMPLETED REACTION.*

By H. C. SOLOMON, M.D., BOSTON,

AND

E. S. WELLES, BOSTON.

The "cerebrospinal syphilitic" type reaction, as most characteristic, is strongest in the third, fourth and fifth tubes, grading off in the first and second tubes and those of the high dilution. Less characteristic is a curve reaching its height in the first tube, but not going as high as 5 plus reaction.

If one charts the gold sol curves at short intervals in the development of the "paretic curve," one finds that there are curves having the form of the second type mentioned of cerebrospinal syphilis reactions, *i.e.* at the end of three or more hours it may have progressed no farther than a 3 plus, while at the end of 12 hours it will have reached a 5 plus reaction. But, in quite a considerable number of cases, one finds that the reaction begins most strongly in the third, fourth, and fifth tubes, and is weaker in the first and second and the higher diluted tubes, so that read at an early time, the curve will be identical with that of the so-called typical "cerebrospinal syphilitic" type, *i.e.*, it has gone through the same reaction, but has finally gone farther, whereas the "cerebrospinal syphilitic" type, that started the same, has halted in its development, or, as one might possibly express it, is a *forme fruste* of the "paretic" reaction.

*Being S. B. I. Contribution whole number 130 (1915.33). *Bibliographical Note.*—The previous contribution was by E. E. Southard and H. C. Solomon, entitled "Latent Neurosyphilis and the Question of General Paralysis (Presenile Paralysis)." BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. cxxiv, No. 1, page 8.

The following charts of the development of the "paretic curve" by three fluids from paretics are illustrative examples.

CHART I.

	1	2	3	4	5	6	7	8	9	10
15 minutes	2	2	3	3	3	2	—	—	—	—
30 "	2	2	3	3	3	3	—	—	—	—
45 "	2	2	3	3	3	3	—	—	—	—
1 hour	2	2	3	3	3	3	—	—	—	—
1 1/4 hours	2	2	3	3	3	3	—	—	—	—
1 1/2 "	3	3	3	3	3	3	—	—	—	—
1 3/4 "	3	3	3+	3+	3+	3	—	—	—	—
2 "	3	3	3	3	3	3	—	—	—	—
2 1/2 "	3	3	4	4	4	3	—	—	—	—
3 "	3	4	4	4	4	3	—	—	—	—
18 "	5	5	5	5	5	4	—	—	—	—

CHART II.

	1	2	3	4	5	6	7	8	9	10
15 minutes	2	2	3	3	3	3	3	2	1	±
30 "	2	2	3	3	3	3	3	2	1	±
45 "	2	2	3	3	3	3	3	2	1	±
1 hour	2	2	3	3	3	3	3	2	1	±
1 1/4 hours	2	2	3	3	3	3	3	2	1	±
1 1/2 "	3	3	3	3	3	3	3	3	1+	±
1 3/4 "	3	3	3	3	3	4	4	3	2	1
2 "	3	3	3	3	4	4	4	3	2	1
2 1/2 "	3	3	3	3	4	4	4	3	2	1
3 "	3	3	3	3	4	4	4	3	2	1
18 "	5	5	5	5	5	5	5	3	2	1

CHART III.

	1	2	3	4	5	6	7	8	9	10
15 minutes	2	3	3	3	3	3	1	1	—	—
30 "	3	3	3	3	3	3	+	+	—	—
45 "	3	3	3	3	3	3	+	+	—	—
1 hour	3	3	3	3	3	3	+	+	—	—
1 1/4 hours	3	3	3	3	3	3	1+	1+	—	—
1 1/2 "	3	3	3	3	3	3	2	2	±	—
1 3/4 "	3	3	3	4	4	4	2	2	1	—
2 "	3	3	3	4	4	4	2	2	1	—
2 1/2 "	3	3	3	4	4	4	2	2	1	—
3 "	3	3	3	4	4	4	2	2	1	—
18 "	5	5	5	5	5	5	2	2	1	—

X

SYPHILIS AND THE PSYCHOPATHIC HOSPITAL:
NOTES ON MEDICAL AND SOCIAL PROGRESS,
ESPECIALLY IN NEUROSYPHILIS, BOSTON, MASSACHUSETTS, 1915.*

By E. E. SOUTHARD, M.D., BOSTON,

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ABSTRACT.

- I. Comparative Importance of Syphilis in Psychopathic Work.
- II. Some Recent Local Laboratory Statistics (W. A. Hinton, Harvard Neuropathological Testing Laboratory).
- III. Economic Notes.
- IV. Adler's Point in Salvarsan Therapy.

*Being S. B. I. Contribution whole number 131 (1915.34). *Bibliographical Note.*—The previous contribution was by H. C. Solomon and E. S. Welles, entitled "The Development of the Gold Sol 'Paretic' Reaction As Compared with the 'Cerebrospinal Syphilitic' Type, Considered from the Time Necessary to Form a Completed Reaction." BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. cxxiv, No. 2, page 50.

- V-VI. Some Anthropological Possibilities in Syphilis Research. (Greig working with Bryan's Formulation; A. E. Taft's Brain Measurements.)
- VII-VIII. Psychological Tests. (Work of V. V. Anderson with Binet Tests; of Bazeley and H. M. Anderson with Binet and Yerkes' Point Scale Tests.)
- IX. Work on the Chemical and Cytological Side. (H. C. Solomon, H. O. Koefod, E. S. Welles.)
- X. Summary.

SYPHILIS AND THE PSYCHOPATHIC HOSPITAL.

WHETHER we regard the Psychopathic Hospital^{1,2} under its aspect as (a) *receiving hospital* for urgent mental cases, or as (b) *observing hospital* for difficult and border-line mental cases, or as (c) *teaching clinic* in psychiatry for medical graduates and undergraduates, or as (d) *dispensary center* for mental hygiene and psychosocial service, or as (e) *research institute* and experiment station for the Commonwealth's scientific officers, we shall not fail to find the problem of syphilis^{3-18*} standing out everywhere in bold relief. It is true that mania and delirium of whatever cause, and especially mental disease immediately due to alcohol, form the initial problem of any institution fashioned—like the Boston institution—on the plan proposed in general terms by Griesinger in his memorable paper of 1868. But, whereas urgent mental cases, whether alcoholic or non-alcoholic, form an inevitable problem in the *Stadtsytl* of Griesinger's dream and the world's sporadic partial realization—for example, alcoholic cases form about one-ninth of our intake of patients in the Boston clinic—and whereas the needs of special treatment of maniacal, delirious, and overactive patients actually dictate structural conditions in the hospital building—for example, 12 tubs for prolonged baths in our hospital of 110 beds with 5 admissions daily, as well as special conditions in ventilation and noise-proofing—yet, after all, these conditions are not absolutely essential to a psychopathic hospital. A psychopathic hospital may perform acceptably almost all the functions listed above (with the exception of the function of receiving numerous urgent cases) even if the hospital be placed in non-metropolitan surroundings or in a small university town like Ann Arbor, Michigan. In point of fact, the delirium tremens problem of a metropolitan district like that of Boston, Massachusetts, having a million and a quarter inhabitants, should perhaps be handled by means of a separate institution with highly specialized equipment; such at least was argued for by the Legislative Commission on Drunkenness, on which I had the honor of serving in 1913. And, if a special hospital for delirium tremens (which disease we do not count in Massachusetts as strictly speaking mental in the sense of a condition to be supervised by the State Board of Insanity) were to be established, the chances are that the more markedly psycho-

pathic alcoholics (victims of acute alcoholic hallucinosis, Korsakoff's disease in acute phases, etc.) might well be handled by the specialists in charge of such a hospital for delirium tremens¹⁰

But, with these alcoholic problems solved or removed, there would still remain the problem of syphilis,—a problem not nearly so likely to be soon solved or removed as that of alcoholism. Specialized clinics like the Psychopathic Ward of the University of Michigan at Ann Arbor or the selected clinic of the Psychiatric Institute of the New York Lunacy Commission associated with the Manhattan State Hospital, Ward's Island, New York, have found attractive material in syphilis of the nervous system. The Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital, Baltimore, Maryland, has also dealt with this material. A great impetus was given to these studies by the Nissl-Alzheimer work on plasmocytosis, by Wassermann's special application to syphilis of the ideas of Bordet and Gengou, by Plaut's application of the Wassermann method to the cerebrospinal fluid, by Ehrlich's invention of salvarsan, and especially in this country by the Noguchi-Moore discovery of treponema in paretic tissues and by the ingenious proposals of Swift and Ellis as to salvarsanized serum.

For convenience I place in the bibliography⁴ references to papers published from institutions under the supervision of the Massachusetts Board of Insanity during the last few years. What, then, is the size and nature of the syphilis problem as faced by the public and social agencies of a state like Massachusetts, especially the problem of syphilis of the nervous system, or, briefly, of neurosyphilis?

The conference of which this is the concluding paper is the fifth of this general nature (I, First Annual Conference on the Medical and Social Work of the Psychopathic Hospital, Boston, Massachusetts, held June 24, 1913; II, Conference on Some Medical and Social Aspects of Mental Disease Due to Alcohol, held November 24, 1913; III, Conference on Nursing Problems, held February 16, 1914; IV, The Second Annual Conference on the Medical and Social Work of the Psychopathic Hospital, held June 26, 1914), and the seventh, if two scientific programs be added. The program of the Norfolk District Branch of the Massachusetts Medical Society was presented at the Psychopathic Hospital, March 31, 1914, and the program of the Boston Society of Medical Sciences on April 28, 1914.

The underlying idea of each conference has been to take account of stock and provide the best concrete program on which locally to proceed.

SOME LABORATORY STATISTICS.

I am informed by Dr. W. A. Hinton, in charge of the Harvard Neuropathological Testing Laboratory* during 1914, that 13% of the blood

¹ The bibliography contains a list of syphilis publications of The State Board of Insanity and the Psychopathic Hospital.

* This has now been taken over by the State Board of Health, with Dr. Hinton as assistant director, in charge of testing.

sera tested during that year were positive. These were drawn from seventeen public or semi-public institutions, and to a minor extent from private sources. In 1913²⁰ the same laboratory had found 23% positive. The institutions have become increasingly suspicious as to the possible presence of syphilis in their patients. Still these cases are obviously selected, and the community index of positive Wassermann tests must be lower than 13%. The figures are based on 6139 and 7748 tests in 1913 and 1914 respectively.

During 1914 the cerebrospinal fluids proved 33% positive, just as they had been in 1913. Possibly this percentage, based on 1566 cases, indicates with some certainty the chances that an "organic" disease of the nervous system has of being syphilitic, although the figures deal with some cases in which the cerebrospinal fluid was examined as a precautionary measure in the absence of "organic" symptoms and on the basis of a positive blood serum.

In 1913 I had occasion to report the extraordinarily high percentage of positive sera (44%) among the girls of the Massachusetts Reformatory. During 1914 it is only by counting "doubtful" reactions as positive that such a percentage can be obtained (45%). The clearly positive sera were found in 20%.

Last year I contrasted this high percentage of the Massachusetts Reformatory for Women (44%) with that of the Worcester State Asylum, a transfer institution for chronic insane of both sexes (2.9%). During 1914 the percentage at Worcester was 6% or, including "doubtfuls," 16%.

Meantime the Danvers Hospital and the Worcester Hospital, representative receiving hospitals, were taking in as routine 12% and 10% respectively of clearly positive cases and 24% and 28%, respectively if "doubtfuls" are counted.

In 1913 the Psychopathic Hospital found cerebrospinal fluids negative in about 63%, in 1914 in about 73% (239 of 327 fluids). This, I fancy, indicates a definite policy on the part of our officers to look on cases as possibly syphilitic with increasing frequency. A little over one in four cases has proved positive.

ECONOMIC NOTES.

Miss Mary C. Jarrett has continued her studies^{21, 22, 23, 24} of the statistical and economic side of psychopathic social service in general by some similar observations in the syphilis department. If we combine her conclusions with the general statistics of syphilis in the psychopathic hospital as presented by Gregg, and with the obvious facts as to the cost of salvarsan and other remedial agents, it is easy to show that the state might find it very profitable to engage in work in neurosyphilis, spending in the first year about \$5000.

Also of great economic importance is the cost of salvarsan therapy in neurosyphilis. During

the present war the cost of salvarsan has been subject to fluctuations, and its future cost is, of course, problematical. However, it seems desirable to give salvarsan, mercury and iodide to appropriate cases of syphilis of the nervous system. In order to estimate the effects of treatment with any of these drugs in any of their forms of application, it is certainly necessary to keep up treatment in each case for at least three months. To estimate the ultimate results is naturally impossible at the present time. On somewhat empirical grounds, the Psychopathic Hospital physicians have come to the opinion that only after 10 injections could we feel that a reasonable trial of the drug had been given. On the basis of 10 cases classified as:

"General Paresis" 6

"Juvenile Paresis" 2

"Cerebrospinal or general neurosyphilis" 2

and omitting the cost of the preparation of the solutions, instruments and the time expended, the total cost has been a little over \$400, and in fact, works out to an average of \$40.26 per patient.

The expenses of these treatments have been paid in practically all cases by the patients themselves, or by their friends, inasmuch as the Psychopathic Hospital has had no funds from which to draw for such treatments.

ADLER'S POINT IN SALVARSAN THERAPY.

Adler's work on salvarsan therapy¹³ has made a small step forward in the understanding of those cases that are injured or even killed by salvarsan. Adler's plausible suggestion is that these cases are really cases with individual idiosyncrasy in elimination of arsenic. Adler has found a case which eliminated arsenic from the blood only after the extraordinary interval of 16 days. It would be homicidal to keep administering arsenic to such a case at the usual intervals.

If the blood proves to free itself of arsenic at the usual interval, say 24-48 hours after exhibition, then salvarsan may well be administered at intervals of three days.

To guide salvarsan therapy in a systematic manner, Adler accordingly advises an initial determination of the patient's elimination-rate.

SOME ANTHROPOLOGICAL POSSIBILITIES IN RESEARCH.

Gregg, studying 100 of our parietic cases,¹⁴ found 83% of North-European racial stock, 82% of subnormal weight (average 23 pounds below normal) and 68% of normal or supernormal height. The typical parietic, then, tends to be a rather tall and thin subject of North-European stock, tends in fact to be of the carnivorous human type as suggestively defined by Bryant (see his lecture²⁵ at the Psychopathic Hospital, January 4, 1915). Gregg also points out how infrequently parietics manifest cutaneous syphilis. Gregg's work points in the direction of special individual susceptibilities as at the basis

BRYANT'S TABLE IV.
DUCTLESS GLANDS.

HERBIVOROUS.

CARNIVOROUS.

Small.	Minus	Genital	Plus	Large, reproductive functions +.
May be large or cystic; adiposis, gigantism, acromegaly.	Plus	Hypophysis	Minus	Variations slight.
Usually large.	Plus	Pancreas	Minus	Usually small.
Calcium balance normal	Plus	Para-Thyroid	Minus	Tetany not infrequent.
Normal or large.	Plus	Thymus	Minus	Usually deficient, may be very large.
Myxoedema	Minus	Thyroid	Plus	Exophthalmic goitre.
Always large, especially cortex	Plus	Supra-Renal	Minus	Always small, vagotomy frequent.

of the paretic form of neurosyphilis. Perhaps the principle should be extended to other forms of neurosyphilis.

Such ideas should be developed and extended in several directions, such as that of the anthropological and psychological study of types of character in neurosyphilis. For instance, we need more knowledge in the more general direction of character-types in Bryant's human carnivores and herbivores, of which there is already some suggestion in Bryant's tabulation. Bryant, in fact, states that the genital glands in his "carnivorous" type are large and the reproductive function in excess; the reverse, he states, holds true of his "herbivores." In evaluating such ideas, it must be remembered that most human beings are more or less evenly balanced between these so-called "carnivorous" and "herbivorous" factors.

At this point Bryant's Table IV may be reproduced, suggesting as it does certain possibilities as to ductless glands in the so-called types. We are doubtless far from able now to suggest differences in the mutual control of these glands, based upon their superior or inferior development.

As to forms of syphilis itself, Bryant believes that the carnivores are more subject to paresis and tabes, the herbivores to ulcer and gumma.

A further possibility of research lodges in the systematic study of brain pattern in paretics to learn whether the original brain plan possessed by paretics is simpler or more complex than normal. Annie E. Taft and the writer have been attempting to develop a method of stating approximately the degrees of complexity in various brain patterns, using the material of the State Board of Insanity as embodied in its large and perhaps unrivalled collection of brain photographs. The details of our method (counting sulci through a window of given size) are to be published elsewhere. I present a table in which certain differences between the complication of pattern in brains in general and that of paretics are shown.

(To be concluded).

Medical Progress.

NINTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.*

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(Continued from page 25.)

FOOT CONDITIONS.

Recently there has been much to lead us to look with more interest upon the flood of foot troubles that occur. The foot as a factor in human efficiency (Tyrell¹⁷) is being recognized industrially, and on the other hand, war has made it necessary to give the greatest attention to the care and treatment of feet in marching (Schuster¹⁸). Hygienic shoeing and the modern shoe in its influence upon the foot have been considered by various authors without definite conclusion. The weak and flat foot (Packard,¹⁹ Marshall²⁰) is looked upon by some as a symptom of general arthritic, postural or vascular conditions. It is undoubtedly true that attention to the prevention of these vascular, postural and arthritic conditions with the proper choice of shoes and care for the simple hygienic foot conditions would be sufficient to eliminate a part of the foot deformities that are so hard to relieve. Undoubtedly the feet should be considered from the engineer's point of view (Rowell²¹), and the complicated arrangement of bones and muscles offers much for discussion. At the end we may find ourselves studying and considering the individual and his particular type of foot.

Steindler's²² work on the architecture of the tarsus is deserving of very careful study by all those interested in deformities of the foot.

In considering the operative aspects of certain foot troubles, (Freiberg²³) the fact that muscle spasm can nearly always be relieved by rest should make one reluctant to subject the patient to conditions worse than static. Rest without the suspension of function may often be obtained by mechanical or therapeutic measures.

Hibbs²⁴ observes that few people are willing to indulge thoroughly in the healthful exercise of walking, and believes this results in their muscle bound feet, due to a limitation of dorsal flexion. He makes a skin incision at the outer edge of the Achilles tendon, splits the sheath, and lengthens the tendon by longitudinal cut and holds it with sutures. He lays especial stress upon the after-treatment of three months in children and six months in adults. The foot is held in plaster, dorsally flexed for three weeks. Then walking, resist-

* This report is based on a review of 480 articles selected from about six hundred titles having to do with orthopaedic surgery appearing between August, 1911, and January, 1915. References are given to only such articles as have been selected for note and comment.

ant exercises to develop the anterior group of muscles, and in adults, ankle braces with stop catches are used. Thirty-eight patients have been treated in this way and in all the function of the foot has been so corrected that they walk normally and without pain. Comparing the results with those treated by conservative measures, he says that only by operation can satisfactory results be obtained and a normal muscle balance be assured.

(ED. NOTE: The editors' experience has not led them to believe that this should by any means represent a routine operation, but that its importance has been perhaps overestimated.)

In the discouraging forms of rigid, spastic flat foot, repeated forcible correction under ether has often failed on account of the indisposition of the patient to carry out the after-treatment. Saxl¹⁸ uses local anesthesia for this, injecting 2 to 4 grams of 1% cocaine or novocaine solution into the astragalo-scapoid joint or peroneal tendons. Various methods of quieting the muscle spasm by nerve paralysis or gradual manipulation seem to have no advantage over the complete relaxation in ether narcosis, which allows the foot to be most easily held in correct position when the plaster is applied.

In advocating the more general use of linear osteotomy in bone deformities, Bradford¹⁹ is strongly in favor of this method instead of removing the head of the first metatarsal bone in hallux valgus. Forcing the osteotome through the tissue to a point on the bone just above the distal end of the metatarsal, he cuts through the bone and forcibly fractures the outer shell, leaving a gap at the outer side to be filled with organizing blood-clot and thus correct the valgus. Avoiding the extensor tendon, the bone can be divided near the joint, and the lateral deformity corrected without interfering with the weight-bearing qualities of the foot.

Katzenstein²⁰ induces hardening and shrivelling of over-stretched and relaxed ligaments responsible for flat foot and other deformities. He discovered by accident the effectual action of the tanning process which he employs and then proceeded to apply it systematically. He uses injections of formaldehyd under local anesthesia into the stretched ligaments. A plaster cast is then applied to hold the ligament in its contracted position. When the cast is removed after three or four weeks, the ligament is firm and hard. He gives an illustration of an apparently almost normal child of five cured of "extreme flat feet and inward bowed legs." He injected the formaldehyd into the tibionavicular ligament and into the median lateral ligament of each knee, with a plaster dressing for the three joints. He thinks that relaxed ligaments are the cause of deformity of bones far more often than is generally recognized. By detecting the loss of elasticity early it may be possible to ward off deformity and correct it by restoring the pull of the ligaments.

(ED. NOTE: This so-to-speak causal treatment of deformity seems to render apparatus superfluous. We have, however, seen no report of the results of this treatment in other surgeons' hands. We wonder whether this artificially produced hardening and shortening is likely to be permanent.)

RICKETS, OSTEOMALACIA, FRAGILITAS OSSIUM.

Considering the etiology of rickets from two opposite points of view, the conclusions are very similar. Curle,²¹ from his clinical experience, states that the two chief factors in the cause of rickets

are the preponderance of carbohydrates in the diet and a lack of pure air. Koch²² injected the streptococcus longus into young animals and an acute infection followed at once, gradually developing a chronic disease of the bone, apparently similar to rachitis in man. He also says that the dogs allowed to run about freely did not develop the bone trouble, or at least not in the same degree as those kept in stalls. His experiences suggest the injurious influences of secondary infection after the process of normal ossification has been upset by the acute infection. He does not believe any one organism is associated with rachitis and recognizes the importance of any factor that lowers the general bodily resistance for a long time.

Cavarzini²³ adds another to the 46 cases on record in which systematic epinephrin treatment cured osteomalacia. At the same time he cites 26 cases that have been reported in which little or no benefit was derived from the treatment. In some of the cases the epinephrin was stopped at the first sign of intolerance, so that the treatment had really no chance to display its efficacy. The hypophysis seems to be able to sensitize the adrenals, and hence combining hypophysis extract with the epinephrin treatment might enhance the action of the latter. He adds that there is much to sustain the assumption that deficient functioning of the adrenals interferes with the normal growth of the skeleton.

Every year more new cases of osteogenesis imperfecta are recognized and the number now well studied is over fifty. Glandular and medicinal treatment seems to be of little avail. Among others, Schabad²⁴ carefully analyzed the metabolism in a case and gives his conclusions. The calcium retention is below normal and the deficiency is best met by the administration of phosphorus and cod liver oil. The injection of calcium is of no advantage. Phosphorus excites a hyperphosphaturia in osteogenesis imperfecta in contradistinction to the hypophosphaturia seen in rachitis.

Ostheimer²⁵ has collected 193 of these cases under the title of fragilitas ossium, a name expressing the chief clinical symptoms, but making no attempt to express the specific cause. Whatever name may be given to this condition, it is to be remembered that the prognosis is nearly always fatal and that we have no definite line of treatment to follow at present and can only hope for guidance by the careful metabolic study of these cases.

BONE GRAFT, BONE TRANSPLANTATION, PERIOSTEUM, ETC.

The operative treatment of tuberculosis of the spine has had sufficient trial to allow one to make a judgment in its favor. Of 39 cases treated at the Mayo Clinic (Henderson²⁶), the Albee method was used in 33; the Hibbs in 6. The oldest case was 52 years and only five were children. One-half were lumbar or low dorsal region, only one was above the mid-dorsal. Without going into detail it can be said that the results were very successful, nearly 75% being improved or cured with no operative fatalities.

(ED. NOTE: The great advantage of shortening of the treatment and hastening the cure of the disease is offered as a strong claim in favor of this procedure. Undoubtedly it does make the treatment more thorough and efficacious and thus hasten the curative healing process, but it does not, in our opinion, warrant any radical shortening of the protective treatment.)

Henderson lays stress on this point in keeping the patient in bed after the operation for one to six

months and insisting on a brace being worn for one year, preferably one year after cessation of all symptoms.

Ryerson¹ reports 37 cases of Pott's disease from his clinic, in which the Albee operation has been performed, and considers that the method has earned for itself a distinct place in the treatment of spinal tuberculosis and that it can almost be classed as the acme of conservative treatment.

In fractures and fracture-dislocation of the vertebrae, Palmer² has tried, with success, the use of bone graft. He thinks that laminectomy should be done in all cases where there is deformity and paralysis, and that at the same time a bone graft may be inserted that will obviate the necessity of wearing a jacket or brace.

In a case of recurrent spondylolisthesis, Ryerson¹ reports a fairly successful result. A young girl of fifteen, carrying a child in her arms, felt a sudden pain in her back and fell to the floor in a faint. Temporary paraplegia developed a week later, and subsequent weakness and numbness in the legs recurred during the next year. On examination it seemed that the fifth lumbar vertebra was capable of being displaced and it was decided to hold this in place with a bone graft. A second operation was necessary to secure firm fixation of the upper end of the graft. This bone splint from the third lumbar to the third sacral segment served to relieve the symptoms.

Galloway³ reports the encouraging results of bone grafting in a case of paralytic scoliosis, but admits that it is too early to judge of its ultimate success.

The function of the periosteum in the regeneration of bone has been the field of much experimental study. According to the research of Moore and Corbett⁴ it is to be disregarded in all bone operations. If convenient, it is to be preserved, because conservation of tissues should be the rule in good surgery, but one should not hesitate to sacrifice it, if necessary.

On the other hand, Haas⁵ says that periosteum is directly and actively concerned in the regeneration of bone. This regeneration also takes place from the marrow, but at a later period and in a more limited degree than from the periosteum. He performed 57 experiments upon the ribs and costal cartilages of rabbits. His deductions as regards regeneration of bone are limited to the bones that arise from cartilage.

Furthermore, as a result of their study, Davis and Hunnicutt⁶ conclude that free periosteal transplants do not produce bone in the large majority of experiments, nor did pedunculated flaps of periosteum. On the other hand, free periosteal transplants and pedunculated periosteal flaps with bone attached produced bone in each experiment. The removal of the periosteum seemed to have little, if any, effect on the nutrition of a bone. After subperiosteal resection of a portion of a bone, the growth of the bone in repairing the defect was from the bone stumps, the periosteum acting as a limiting membrane.

In this confusion of ideas it may be remembered that to strip the periosteum entirely free from any of the cells of the cortex is a difficult task and the exactness of the experiments may be questioned. The conclusions of Phemister⁷ in his studies on the fate of transplanted bone may be accepted as expressing as clearly as possible our present understanding of this question.

"Osteogenesis and bone repair occur through the inner layer of the periosteum and endosteum, and to much less extent, through the bone cells and fibrous contents of the Haversian canals." Viability of the transplant depends largely upon its ability to get nutrition which is suited to it, and this point he explains in detail according to the different demands of membrane and bone. According to Roux's law of functional adaptation, the bone transplant placed to fill a bone defect undergoes progressive changes, while in soft parts retrogression and disappearance take place. Axhausen's claim that osteogenesis does not take place through bone devoid of periosteum and endosteum is incorrect. The subsequent fracture of the piece of transplanted bone has been found healed by a well formed callus. When bone is transplanted in soft tissues there is no functional demand for the bone, and there is no more tendency for it to form than when periosteum is so transplanted. In any case, it is best to use the transplant with both the periosteum and endosteum intact.

Mayer and Wehner⁸ after a careful experimental study, emphasize the osteogenetic function of the specific-osteoblastic cells of the periosteum and the inability of the adult bone cell to form new osseous growth. Bone macroscopically bare of periosteum can be successfully transplanted into the soft parts, not because the bone cells give rise to new bone formation, nor because of a metaplasia of the surrounding connective tissue cells into osteoblasts, but because of adherent periosteal cells and of living endosteal cells.

SCOLIOSIS.

The Second Report of the Scoliosis Commission,⁹ appointed by the American Orthopaedic Association, is important. This Commission during its first year of existence, studied the results of the treatment of lateral curvature by various forms of plaster jackets, attempting to use the records of the different orthopaedic surgeons. These records in almost all cases they found to be unsatisfactory, and this second report records the results of six months' treatment of structural cases in four different clinics, all of the records having been taken in standard and identical fashion by the Commission themselves, both before and after the treatment. These clinics were those of Lovett, at the Children's Hospital, Boston; Abbott, at the Children's Hospital in Portland, Maine; Kleinberg, at the Ruptured and Crippled Hospital in New York, and Adams and Danforth at the Massachusetts General Hospital in Boston. They also memorialized all members of the American Orthopaedic Association and asked them whether they had themselves over-corrected any cases of structural scoliosis by any method. Six answered that they had, but none of them on further investigation were able or willing to offer evidence that such was the case, and since the completion of the report, the one definite and unqualified claim of cure in undoubtedly structural scoliosis referred to in the report of the questionnaire, has been retracted by letter to the Committee. We print certain of the findings of this Commission, which was an entirely impartial one. All its members were eager to discover a method by which this resistant deformity might be over-corrected, or even corrected, with a reasonable degree of safety and a fair degree of constancy.

The following summary is offered as the result of the investigation of the second series of cases:

1. No case of *over-correction* of the elements of deformity in structural scoliosis has been presented to the Committee, in which they have been permitted to observe and record the condition of the patient from a time preceding the beginning of treatment.

2. The time allowed by the Committee has been sufficient, in their judgment, for such a demonstration, were it possible in the respective patients and by the respective methods.

3. The same statements may be made with respect to complete correction of the elements of deformity.

4. The amount of correction demonstrated to the Committee by means of the method of Forbes is unsatisfactory and is to be regarded as an entirely insufficient reward for the amount of labor, discomfort and other inconvenience which is involved.

5. In mild cases of undoubtedly structural scoliosis, and perhaps in some moderately severe cases, considerable degrees of correction may be achieved by means of the method of Lovett, Abbott and by Kleinberg's brace.

6. It seems probable that greater degrees of correction may be obtained with the flexed position of the spine than with the extended position of the spine.

7. It does not appear that the use of extreme force is justified by the results which are to be obtained from it.

8. In order to have reciprocal application to the given case, all records should be made with the patient in the same position; this refers to the clinical, photographic and roentgenographic record and to the horizontal or upright position of the patient.

9. For purposes of record the upright position is to be preferred.

These findings should give us pause in employing excessively severe methods and at the same time should stimulate our endeavors to relieve this baffling condition.

FRACTURES.

Among the interesting cases that come to the orthopaedist for treatment of back strain are the often unrecognized fractures of the transverse processes of the vertebrae.

Among the 116 cases of back pain following injuries, Ewald¹ has observed four cases of isolated fracture of one or more transverse processes. In two cases a direct injury was reported, for the others a similar mechanism is supposed, since Ewald doubts the generally accepted mechanism by muscle pull. The typical symptoms were present in all cases: local tenderness, pain in bending over to the unaffected side and in rising to an erect position from the flexed position, in lifting of the legs from lying, and in going upstairs, lateral deviation being toward the good side. The diagnosis can be made by the x-ray only. Prognosis is favorable. Plaster strapping, or a wide webbing belt, is sufficient treatment.

In an article urging the use of plates in fractures, Raynaldo dos Santos² reports a case of separation of the anterior tuberosity of the tibia in a young man, by a sudden muscular contraction. The tuberosity was pushed down and the fragment held in place by the use of two plates. A perfect functional result was obtained.

(ED. NOTE: A great variety of plates and screws, made of various metals, ivory, live and dead bone, are used in fixing fractured fragments. The results seem to be equally good under these different methods and each operator has his special favorites to which he has become accustomed and with which through his skill in their use he obtains the best results. The auto-bone graft, when available, should give the best result.)

Associated with the odd fractures that are seen in orthopaedic practice are the traumatic disturbances of nutrition in the semilunar bone. After discussing our present knowledge of those peculiar affections of some carpal bones, as have been described by Preiser for the scaphoid and Kienboeck for the semilunar, Frenkel³ reports two such cases of so-called "Kienboeck's disease of the semilunar bone, one case a housemaid of 25 years, and the other a carpenter of 30. In the history of the second case there was evidence of an injury, which was proved by the x-ray picture, four and one-half years after the accident. The original picture had shown a fissure of the radial epiphysis only. In both cases the clinical signs consisted in limited motion of the wrist, pain in motion, and tenderness over and near the semilunar bone. X-ray pictures showed an irregular structure, some parts being more, some less, dense than normal; also flattening and reduction in size. In one case a microscopical examination was done which showed a compression fracture secondary to a primary disturbance of the nutrition of that bone. There seems to be a certain similarity of these affections with those known as Koehler's disease of the tarsal scaphoid.

BACK STRAIN.

There have been published many articles on the subject of backache. Such a broad title includes nearly the whole scope of orthopaedics, from the foot to the top of the spine.

Beyond the pathological lesions that cause definitely localized pain in the back, there are other conditions that must be differentiated and more care given to their diagnosis. The importance of poor posture and the related visceroptosis is recognized. Attention is called to these facts by Ogilvy,⁴ when he insists that the patient should be more carefully examined and a more definite diagnosis made. The importance of muscle strain due to bad balance of the body is emphasized. There is perhaps little new in what he writes, but the field is open for important study of the mechanical strains of the body structure.

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President's address:

PASTEUR.

DR. GERALD B. WEBB of Colorado Springs, Colo., made this address, in which he stated that in reading Pasteur's life it had occurred to him that they as immunologists could not hear too often or too much of this, their greatest master. Pasteur's advice to the students of the University of Edinburgh was, "Worship great men." He agreed with the anonymous writer in the *Spectator*, "that he was the most perfect man who had ever entered the Kingdom of Science." He reviewed the early history of Pasteur, showing that he was fortunate in his parents, having a father that was reserved and of a slow and careful mind, and a mother, active, full of enthusiasm, and of imagination. He was equally fortunate in choosing a wife who was willing that the laboratory should be put before anything else. The speaker dwelt on Pasteur's work on fermentation, and his discoveries with reference to the disease of yeast and of the silk worm and of what these meant to the wine, beer, and silk industries of France. He reviewed the other discoveries of this great scientist which were familiar to them all. In speaking of Pasteur's attitude during the Franco-Prussian War, he said that he was unable to concentrate on his work and wrote, "This war has sent my brains to grass." Later he wrote, "Might and right struggle for the world; right which constitutes and preserves society; might which overcomes nations and bleeds them to death." His writing on the psychology of war and his description of the horrors he witnessed formed a counterpart of similar crimes reported recently, and in choosing a discourse on this subject he wrote, "But we may assert that French science will have tried by obeying the law of humanity to extend the frontiers of life." In 1874 Tyndall, after thoroughly investigating Pasteur's experiments, wrote, "For the first time in the history of science we have the right to cherish the sure and certain hope that, as regards epidemic diseases, medicine will soon be delivered from quackery and placed on a real scientific basis. When that day arrives, humanity, in my opinion, will know how to recognize that it is to you that will be due the largest share of her gratitude." After relating still further the discoveries of Pasteur, Dr. Webb stated that it is not generally known that the first experiments in "carriers" dated from Pasteur.

Pasteur was much more forceful than his biographers had indicated. He rarely visited a theatre or went out socially, feeling like the philosopher who said, "I am never bored but when I am being entertained." Pasteur read only what was good, and especially selected biographies. His advice to students should be emphasized: "All experimental research must be guided by some preconceived ideas. Exhaust every possible combination, until the mind can conceive no other possible. It is indeed a hard task when you believe you have found an important scientific fact, to constrain yourself for days, weeks, years sometimes, to fight with yourself, to try to win your own experiments, and only proclaim your discoveries after having exhausted all contrary hypotheses."

In closing, Dr. Webb advised his hearers to read the life of Pasteur by Vallée-Radot, a book which he described as reading like a fairy story, and one which should be memorized by all.

Reports of Societies.

AMERICAN ASSOCIATION OF
IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Continued from page 25)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.

A CLINICAL STUDY OF THE COMPARATIVE RESULTS OF THE WASSERMANN REACTION.

DR. A. A. UHLE and DR. WILLIAM A. MACKINNEY presented this paper in which they stated that under no circumstances should a diagnosis of syphilis be based on the result of the Wassermann reaction alone. The serologist's report should be positive or negative, and if it was at variance with the clinical expectancy other specimens of blood should be submitted to one or more serologists for confirmation before such a result should be seriously considered. A negative Wassermann did not exclude syphilis, since such a reaction might be obtained in the early stages of chancre or might be the result of active treatment, or might exist in latent syphilis in which the foci of disease were not active to the extent that antibodies might be detected by the test. In latent syphilis a negative reaction at times became positive after active treatment. In certain cases of nervous syphilis the serum Wassermann reaction might be positive. After an intraspinal injection of salvarsanized serum, a formerly negative spinal fluid Wassermann test might become positive. Many competent observers had reported positive luetin tests with a negative serum Wassermann test. Certain factors, irrespective of the test itself, were considered responsible for discrepancies. These included the age of the serum, infected serum, non-sterile test tubes, the character of the glass of the test tube, changes in the blood as the result of faulty metabolism, influence of alcohol, etc. It could be readily understood why discrepancies should exist in reports from different laboratories; conflicting reports from the same serologist upon specimens from the same individual withdrawn at the same time under identical conditions were not easy to understand. After discussing the discrepancies in the Wassermann reports with several serologists, it was decided that a series of blood specimens from approximately 300 patients be submitted for the examination in order to ascertain to what extent the above mentioned factors influenced the Wassermann test. The first part of the work was done by four serologists and later three more cooperated. These men were all representative serologists connected with teaching institutions. The blood was collected from normal individuals, from patients in private and hospital practice who suffered from diseases other than syphilis, and from syphilitics in every stage of the disease. With a few exceptions all the syphilitic patients had been under their care for some time and several Wassermann tests had been reported on them before this study was undertaken. The blood was collected under the usual precautions and the specimens were so tabulated that those making the tests knew nothing of the specimens. These specimens were taken when the stomach was full and when empty. In one series two tests were made on each specimen, one of which was a non-infected serum, while the other was infected with virulent pathogenic organisms. In another series the serum Wassermann and the spinal fluid Wassermann were studied comparatively. In latent syphilis a classification was made of those who at the time of the taking of the blood showed no demonstrable lesion of the disease irrespective of its duration. The periods of latency were classified according to the duration of the disease. The authors exhibited fifteen tables showing the results of these tests by the different laboratories and a number of summaries explaining them, from which they concluded

that it seemed to them that the extreme variations in the results of the Wassermann tests on blood serum, taken from the same individual under identical conditions as they were reported by several serologists, were not due to any of the factors which were frequently considered responsible for such discrepancies. The same variations occurred when the blood was collected in a sterile or non-sterile tube, when infected by certain pathogenic bacteria, or irrespective of the time elapsing between the collection of the blood and the time of the examination. In non-syphilitic cases a positive Wassermann report might be expected in from two to eighteen per cent. of the cases, in active primary, secondary and tertiary manifestations of syphilis. With the exception of the first few days of a chancre, a positive Wassermann was present in from 50 to 100 per cent. of the cases. In syphilis under active treatment, or when the condition was latent, the result of the Wassermann reaction was of the utmost importance to the clinician and it was in these conditions that the most extreme variations were reported. In the study of these cases it became clear that the discrepancies in the Wassermann reports, made by the different serologists, were due to errors in technique, or lack of proper standardization of the reagents.

PSUEDO-POSITIVE WASSERMANN REACTION IN A CASE OF UREMIA AND INTESTINAL TOXEMIA.

DR. JUDSON DALAND of Philadelphia reported this case which occurred in a man, 53 years of age, a plumber by occupation, who was admitted to the hospital, on February 10, 1911. There were ascites, edema of the lower extremities, penis and scrotum, moderate dyspnea which became extreme upon assuming recumbency and after slight exertion, and slight cyanosis of the fingers and lips. There was nothing of importance in the family history or habits of the patient. His present illness began January 16, 1911, when he felt as though a nail had been driven through his left knee and a few minutes later a swelling in the feet and knees, rapidly involving the legs, which was rapidly followed by ascites. The physical examination showed extreme pallor, poor musculature, cyanosis, a few enlarged glands in the neck, axilla and groin. The pupils contracted equally and responded normally to stimuli. The teeth were absent. The apex beat of the heart was one half inch outside nipple and the impulse was heaving. The area of heart dullness was increased more especially to the left. The pulse was regular in force and rhythm, compressed with difficulty, and the radial arteries were sclerosed. The first sound was rough and accompanied by a blowing systolic murmur, transmitted to the left axilla. A similar murmur was heard over the aortic cartilage and was transmitted into the neck. The aortic sound was accentuated. The liver was slightly enlarged. The diagnosis was chronic interstitial nephritis and uremia in association with intestinal toxemia. The records of the blood pressure, blood examinations, urinary examinations were presented. The four Wassermann tests taken at intervals during the two weeks following his admission to the hospital showed one three-plus Wassermann, two positive reactions and one plus-minus reaction. This being the last of the four. The urine showed a moderate amount of albumen with hyaline and granular casts and a large amount of indican.

DR. JOHN A. KOLMER, Philadelphia, Penn.: I feel

that the other side of the question as to the specificity of the Wassermann reaction needs some defense. I have long been interested in the question of the antigens, especially with the cholesterine extract. I have followed many patients through their clinical course of the disease and have made comparisons with the aid of several clinicians as to the Wassermann findings. I am of the opinion that this reaction is due primarily to some difference in the antigen. A proper understanding of the mechanism of the Wassermann reaction, and the proper use of the antigen, will modify our results more than anything else, more than any other factor. I do not believe the alcoholic extract of a syphilitic liver a specific antigen. Nor do I believe in the specificity of the aqueous extract of rabbits' livers. Two years ago I worked with a pure culture which was furnished me by Dr. Noguchi of New York. He believes that the specificity of the Wassermann reaction does not depend upon the antigen but upon the nature of the antibody. The antibody plays a big part, or constituent, of the Wassermann. It has been our purpose for three or four years to use three different extracts; one to be reinforced with cholesterine; another, the alcoholic extract of syphilitic livers as used in the United States and Germany; and another, the use of an acetone which was insoluble, the extract prepared after the method of Dr. Noguchi. We found the highest percentage of reactions was obtained when they followed the method of Dr. Uhle. The use of the alcoholic extract of syphilitic livers yielded the poorest results. I believe that the reports of the members differed in the results of the Wassermann reaction, coming from different laboratories, but not from any difference in the technique but because of differences in the antigen. A review of the literature regarding the specificity of the Wassermann reaction is entirely misleading. The reports regarding scarlet fever are also misleading. In my experience with 250 cases, only seven gave a reaction, and two of these had either a macular or papular rash of syphilis. From the standpoint of the laboratory man, we respect the specificity of the Wassermann reaction. I have found it on three occasions in the tubercular variety of leprosy and also in yaws. I believe that syphilis may be diagnosed in the laboratory. The statement, however, that the individual does not have syphilis does not exclude this disease; many of these patients had their symptoms clear up when under anti-syphilitic treatment, and this makes it presumably evident that the patient really suffered from a true case of lues.

DR. KENYON, Municipal Laboratory, Washington, D. C.: I agree with what has been said in regard to the specificity of the Wassermann reaction and the importance of reinforcing it with antigen. I believe that the discrepancies found in the laboratories are due to the fact that different antigens are used. There is one important thing that should be kept in mind—in the series of cases Dr. Uhle mentioned—at what time was the reaction made in the given blood? It is well understood that those who partook of alcohol in considerable quantities have the Wassermann reaction much modified. We have ascertained that in many cases where the reaction would be negative during the first twenty-four hours, if the reagent was kept for one week or ten days and at a proper given temperature, many of the sera would be given with positive results.

CAPT. VEDDER, U. S. A.: I am perfectly in accord with what Dr. Kolmer has stated and especially

what he says regarding a proper diagnosis, which should not be made on a positive Wassermann reaction alone. We all know that lesions of syphilis can occur without any history of clinical signs being manifest. A prominent dermatologist from one of our largest cities came to me and I found a positive Wassermann reaction. He said to me, "I may have a positive Wassermann, but I have never had syphilis." He had a serious cardiac condition which was probably due to syphilis. He was positive that at no time had he been exposed to lues. I believe that there is a certain number of cases which can be diagnosed only by the Wassermann test.

With regard to the normal cases in which the reaction varied from 0 to 10%, I have just completed a survey among 1500 soldiers and I can report a positive Wassermann reaction in about 3%. Does obtaining a positive reaction mean syphilis, or does it not? There are, no doubt, many cases of syphilis that did not come to the physician; they had the disease but it could be detected only by the Wassermann.

(To be continued.)

Book Reviews.

The Medical Clinics of Chicago. Volume I, No. 2. (September, 1915.) Octavo of 194 pages, 44 illustrations. Philadelphia and London: W. B. Saunders Company. 1915. Published bi-monthly.

"The Medical Clinics of Chicago" are presumably patterned after the successful "Murphy Clinics." In the present number of essentially two hundred pages ten internists discuss a variety of clinical cases. The cases are interesting and on the whole well discussed. One loses the personal note that dominates "Murphy's Clinics." However, it is not yet apparent whether a considerable number of contributors will be an element of strength or weakness. Those practitioners who like their information always draped on the lay figure of the clinic patient will read "The Medical Clinics" with pleasure and some profit.

Encyclopedia Medica. Second edition, under the general editorship of J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E. Vols. I and II. New York: The Macmillan Company. 1915.

The first volume of the second English edition of this standard medical encyclopedia was reviewed in the issue of the JOURNAL for September 9, 1915. This American edition does not differ obviously or importantly from its original except in binding and in the title page. The first volume extends from abattoirs to asphyxia and the second from aspiration pneumonia to chlorodyne. The remaining volumes may be expected in regular succession. This edition for the American market places an important English work of medical reference within easy access to the American profession.

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MASSACHUSETTS MEDICAL SOCIETY.

MALPRACTICE DEFENCE.

UNDER the terms of the Act for the Defence of Suits for Malpractice, adopted by the Massachusetts Medical Society, June 10, 1908, active Fellows of the Society may receive defence in the courts of the Commonwealth when they are accused of malpractice, without expense to them. The Society, in accord with the practice of twenty-two state medical societies having similar acts, pays the costs of defence but pays no damages, should any be awarded, the purpose of the act being to discourage suits and to fight unjust claims against members of the profession, but not to enter into commercial insurance. Every community has an increasing number of rapacious lawyers who are ready to threaten suit, or to bring suit, for the sake of a possible fee, to be obtained from the frightened doctor or from the insurance company in which he is insured, and the process of bringing suit, under our present laws, is all too easy of accomplishment.

Experience has shown that not all physicians are careful in keeping notes of their cases, and that in the event of claims for alleged damages from malpractice, the physician is sometimes placed in a false light by his inability to furnish to the Society's attorney the exact facts in a given case. Therefore, Fellows are urged to keep accurate records of the history, diagnosis and treatment of all their cases. In fracture cases the importance of having an x-ray plate made, if in any way practicable, is to be insisted on, as a matter of protection, if for no other reason. The possibility that a dissatisfied patient will have one made by the advice of another medical attendant at a later date, is always to be borne in mind, with the chance that the treatment given will be reviewed in court by the testimony of a roentgenologist, no matter how little the x-ray findings may have contributed to a proper diagnosis.

Finally, Fellows are advised to place their cases in the hands of the secretary early—upon the receipt of a lawyer's threatening letter—so that there may be sufficient time to prepare a defence. Too often the papers are not entrusted to the Society until the last minute, when time barely suffices for the president, secretary and attorney to give them suitable consideration before court proceedings are to begin. The chief advantage of early application for malpractice defence both to the Fellow and to the Society, at the same time accomplishing one of the purposes of the act, is that in a large majority of the cases the plaintiff attorney, when he learns that defence is likely to be assumed by the Massachusetts Medical Society, does not bring suit.

AN INTIMATE ACCOUNT OF A GREAT MEDICAL DISCOVERY.

THE December number of *The Scientific Monthly* contains an interesting article by Dr. Aristides Agramonte on the circumstances of the discovery of yellow fever infection. Dr. Agramonte was one of the members of the commission appointed by the United States Government to study the disease, the other members being Major Walter Reed, Dr. James Carroll, and Dr. Jesse W. Lazear, who contracted yellow fever in the course of his experiments and died. This commission met in Cuba for the first time

on June 25, 1900. Drs. Reed, Carroll and Lazear established themselves in the military barracks at Camp Columbia, and Dr. Agramonte was put in charge of the laboratory at Havana. They began work at once. An epidemic of yellow fever in Quemados, a small town near the barracks, and a later outbreak in Santa Clara furnished sufficient material. They were soon impressed with the fact of the apparent harmlessness of the clothing of the sick, the phenomenon of distant infection, and the possibility of the intervention of an insect host. The champion of this theory had been for a number of years Dr. Carlos J. Finlay, whose obituary appeared in the issue of the *JOURNAL* for September 16, 1915. As early as 1881, Dr. Finlay announced his theory that the bite of the mosquito was the mode of transmission of yellow fever; but he had been so unsuccessful in demonstrating his theory that, although he still stoutly maintained his opinion, he received little credence, and was even laughed at for his contentions. On the first day of August the board met and, after due deliberation, determined to investigate mosquitoes in connection with the spread of yellow fever, Dr. Lazear to have charge of the work. A visit was now made to Dr. Finlay, who, much elated at the news that the board was about to investigate his theory, very kindly explained many points regarding the life of the one variety of mosquito he thought most guilty, and furnished a number of eggs. Lazear hatched the eggs, and applied some of the mosquitoes to cases of yellow fever at Las Animas Hospital, Havana. After the mosquitoes had fed upon the yellow fever patients they were applied, at intervals of two or three days, to whoever would consent to run the risk of contracting the disease. Common opinion was so against this mode of transmission that numerous volunteers allowed themselves to be bitten. As time passed and none contracted yellow fever, the board became somewhat discouraged, and their faith in success very much shaken. In the afternoon of August 15, Dr. Carroll was examining with Dr. Lazear infected mosquitoes brought that day from the Las Animas Hospital. One mosquito, which had refused to feed, looked so weak and tired that Carroll allowed it to settle on his arm and feed, in order that it might not die. Two days later Dr. Carroll developed a severe case of yellow fever, from which he fortunately recovered in due time. Convinced that Dr. Carroll's fever was

caused by the bite of the mosquito, Dr. Lazear and Dr. Agramonte decided to test it upon the first non-immune person who should offer himself to be bitten.

"Barely fifteen minutes may have elapsed since we had come to this decision when, as Lazear stood at the door of the laboratory trying to 'coax' a mosquito to pass from one test-tube to another, a soldier came walking by toward the hospital buildings. The man stopped upon coming abreast, curious no doubt to see the performance with the tubes, and after gazing for a minute or two at the insects he said, 'You still fooling with mosquitoes, Doctor?' 'Yes,' returned Lazear, 'will you take a bite?' 'Sure, I ain't scared of 'em,' responded the man. Lazear looked at me as though in consultation; I nodded assent, then turned to the soldier and asked him to come inside and bare his forearm. Upon a slip of paper I wrote his name while several mosquitoes took their fill. William H. Dean, American by birth, belonging to Troop B. Seventh Cavalry; he said that he had never been in the tropics before and had not left the military reservation for nearly two months. The conditions for a test case were quite ideal. Five days afterwards, when he came down with yellow fever, and the diagnosis of his case was corroborated by Dr. Roger P. Ames, U. S. Army, then on duty at the hospital, we sent a cablegram to Major Walter Reed, chairman of the board, who a month before had been called to Washington upon another duty, apprising him of the fact that the theory of the transmission of yellow fever by mosquitoes, which at first was doubted so much and the transcendental importance of which we could then barely appreciate, had indeed been confirmed."

The article then concludes with the story of the confirmatory work carried on by the board during the following autumn in an experimental camp provided for them by Brigadier-General Leonard Wood, the military governor of the Island, who thoroughly appreciated the importance of their work and ably assisted them. At this camp experiments to disprove the theory of infection from clothing were carried on. A building, in which all sorts of soiled bedding and linen used by yellow fever patients were placed, was occupied for twenty consecutive nights by Dr. Robert P. Cook, U. S. Army, and six others volunteered to subject themselves to the test. For further experiments with mosquitoes, John R. Kissinger, a private in the Hospital Corps of

the Army, and J. J. Moran, a civilian employee, offered their services. Both these men, in due time, suffered from yellow fever, and until very recently had never obtained any reward for the great risk which they ran so voluntarily and praiseworthy. The death of Dr. Lazear on September 25, who had been bitten by a free mosquito in one of his visits to the Las Animas Hospital, adds to this intimate and vivid account of the final discovery of the transmission of yellow fever the note of tragedy so often met in the history of momentous achievement.

ACIDOSIS AND INFLUENZA.

IN the issue of the JOURNAL for December 16, 1915, we published a brief editorial on the occurrence of two cases of acute epidemic acidosis in Belmont, Mass., and expressed the hope that further extension of the disease in the community might not occur. Unfortunately, during the succeeding weeks a considerable outbreak of the disease has taken place. The majority of the cases have occurred in Brighton, Brookline and Cambridge; and in the daily press several hundred alleged cases have been reported. As a matter of fact, however, many of these are probably not true acidosis. The total number of deaths thus far reported is fourteen, and of these all have been children with the exception of one young woman of twenty-four. In the deaths and in the undoubtedly genuine cases which have recovered, the symptoms and clinical picture have been the same as in the Concord (N. H.) epidemic referred to in our editorial, and originally described by Dr. Carleton R. Metcalf of that city.

Concurrently with this epidemic there has been in this community, and indeed throughout the United States, almost a pandemic of acute respiratory infection, taking the varied forms of common colds, tonsillitis, influenza, so-called grip and pneumonia. We commented editorially upon these infections in last week's issue of the JOURNAL. In Massachusetts the cases of these infections have been numbered by the thousands, and similar extensive outbreaks are reported simultaneously from New York, Chicago, San Francisco, Philadelphia, Cleveland, Detroit, New Orleans, Seattle, Los Angeles, Baltimore, Memphis, Tenn., Prov-

dence, R. I., and Savannah, Ga. In all cases the fatalities from the pneumonic and other severe forms of infection have been numerous and have raised local death rates far above the average figures. In Philadelphia, for instance, during the week ended December 30, there was a total of over 450 deaths from acute respiratory infections alone, and in Cleveland and Detroit, there are estimated to have been over 100,000 cases each. In Boston during the week ended January 3 there were seventy deaths from pneumonia, and in many surrounding towns the death rate from respiratory infections has been more than 50% higher than the average. Dr. Francis X. Mahoney, Boston Health Commissioner, has issued a statement to the public relative to these diseases, from which the following is a partial quotation:

"The tremendous increase in the number of deaths from these diseases at this time should serve as sufficient warning to people in this city, and that while, in itself, influenza did not contribute as large a total of deaths as did pneumonia and tuberculosis, it was the starting point of these fatal terminations.

"Influenza is highly communicable during the early stages of the disease, and this minute bacillus, discovered by Pfeiffer in 1892, spreads from person to person, and naturally where congestion is greatest.

"Contrary to the previous history of this disease, this time it has started in the Western and Southern parts of the country and moved Eastward. Some weeks ago it was reported in epidemic form in Jackson, Mississippi, and later in Milwaukee, Wis., coming East to Philadelphia, New York and Boston, leaving a great toll of deaths in its wake. Whether or not the two great gales recently had anything to do with the contrary direction in which this disease traveled, is open to investigation.

"The usual period between exposure and infection is from two to three days, although infection often takes place in a few hours. It may come in the form of a gastro-intestinal type, or the other type, which is the most common,—respiratory."

The concurrence of these epidemics of acidosis and of respiratory infections, raises the question whether possibly this acute form of acidosis may not be one of the types of manifestation in children of the same prevalent infection which in the majority of cases and in adults produces the respiratory symptoms of so-called influenza. The fact that in the present epidemic of influenza there is in adults a definite type of the disease in which gastro-intestinal symptoms predominate, lends plausibility to this theory. Dr.

Metcalf, however, to whom we owe the classic description of the Concord epidemic, believes that this is not the case, and that acute epidemic acidosis in children is a separate clinical entity with a definite, though unknown, infectious etiology and symptomatology. The subsequent study and comparison of data gathered in this present epidemic, may afford positive aid in the determination of this important question. At the present writing, fortunately, the acidosis epidemic appears to be at an end,* and the pandemic of respiratory infections seems to be losing its extent and virulence. A period of generalized immunity should succeed so widely prevalent a condition as the latter, but its sporadic recurrence may be expected during the winter months, and should be carefully watched for by practitioners in order that it may be promptly isolated and suppressed.

FREE WASSERMANN TESTS.

In an editorial on "The Control of Venereal Disease" published in the *BOSTON MEDICAL AND SURGICAL JOURNAL* for August 28, 1913, the statement was made that "the first step in the assumption of a definite policy should be, in our opinion, the free examination of blood for the detection of infectious cases of syphilis and gonorrhea." Since the first of this year, the Bacteriological Laboratory of the Boston Health Department has been examining, without charge, blood specimens by the Wassermann test for syphilis. The requirements for having the test done are that the patient shall go to the Laboratory, Room 1101, City Hall Annex, on Monday, Tuesday, Wednesday or Thursday, from 2 to 4 p.m., when the blood will be taken, and that he shall present a history card carefully prepared by his physician. The benefits which may result from this new service seem to us more than the mere acquisition of information about any one patient. The recognition of the disease by the Health Department and the filing of reports of cases tend to place the disease upon the same footing as diphtheria or tuberculosis, and are first steps towards preparing the public for some kind of registration and oversight of infectious syphilitics.

Furthermore, the accumulation of data from large numbers of cases will in time give real information as to whether syphilis is really a cur-

* On January 7, however, nearly 50 new cases were reported in Newton, Brighton, Allston and Watertown.

able disease, and as to the amount of treatment required to achieve this end.

Moreover, on the last page of this issue of the *JOURNAL*, we publish a notice from the Massachusetts State Department of Health announcing its establishment also of a laboratory for the performance of free Wassermann tests for public institutions, local boards of health, and private physicians throughout the Commonwealth. These provisions, carrying out the suggestion and recommendation of the *JOURNAL*, complete the equipment of communities in this state for dealing adequately with the diagnosis of this most important disease.

DOCTOR JAMES CLARKE WHITE.

THE death of Dr. James Clarke White on January 6 takes from the *JOURNAL* its senior past editor, and from the Boston profession one of its most distinguished elder members. Born at Belfast, Maine, on July 7, 1833, Dr. White graduated from Harvard College in 1853 and from the Harvard Medical School in 1856. After studying at Vienna under the leading European specialists in diseases of the skin, he returned to Boston, and was the first physician in this city to practice exclusively dermatology, in which he attained international reputation. He became an editor of the *JOURNAL* in 1863, and served with ability and distinction in that capacity until 1866. For many years, then and thereafter, his writings adorned the columns of this publication, in which his latest contribution, the obituary of his contemporary and lifelong friend, Dr. Benjamin Joy Jeffries, appeared as recently as December 9, 1915. Dr. White's literary style was the appropriate expression of his courtly and discriminating personality, whose punctiliousness and refinement were surpassed only by the unfailing kindness, courtesy, and integrity of his disposition, and by his professional learning and skill. Both he and the community are fortunate in the son and successor whom he leaves to continue his work and to maintain the medical traditions of his family.

MEDICAL NOTES.

BEQUEST TO NEW YORK ACADEMY OF MEDICINE.—The will of the late Dr. Rudolph A. Witthaus bequeathes to the New York Academy of

Medicine almost his entire estate of over \$150,000, also including his books, all to be used for the benefit of the library.

NEW PUBLICATION.—The publication of a new journal, the official organ of the American Association for Cancer Research, is announced. It is called the *Journal of Cancer Research*, and is to be issued quarterly. Dr. Richard Weil of Cornell University Medical School is editor, assisted by Joseph C. Bloodgood, of Johns Hopkins University, Leo Loeb of Washington University, Ernest E. Tyzzer of Harvard University, H. Gideon Wells of the University of Chicago, and William H. Woglom of Columbia University.

LONDON DEATH RATES IN NOVEMBER, 1915.—Statistics recently published show that the total death rate of London in November, 1915, was 16.2 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 22.1 in Finsbury, a populous central region, and the lowest was 11 in Hampstead, an open suburb on the north.

PREVALENCE OF MENINGITIS, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for December 24, 1915, states that during the month of November, 1915, there were in Ohio 21 cases of cerebrospinal meningitis, 40 of poliomyelitis, 216 of smallpox and 394 of typhoid fever. During the same period there were 16 cases of poliomyelitis each in Massachusetts and Minnesota. There were 125 cases of smallpox in Minnesota; and of typhoid there were 315 cases in Maryland, 255 in Massachusetts, 116 in Michigan, 109 in Minnesota, and 144 in New Jersey.

TYPHUS IN MEXICO.—A report from Juan T. Burns, Mexican consul at Galveston, Texas, states that during the first two weeks in November there were 315 deaths from typhus in Mexico City, and that during the first two weeks of December there were approximately 1500 new cases reported. During the month of December there was a total of 3241 cases of the disease, with 305 deaths, as compared with 404 deaths in November. Report from Washington, D. C., on Jan. 6, states that on that date there were 2500 cases in Mexico City and its suburbs. Every physician connected with the Government has been directed to place his services at the disposal of the Board of Health in an effort to control the disease.

BILL TO AID THE TUBERCULOUS.—It is reported that a bill is to be introduced in Congress which provides for the standardization of the treatment of tuberculosis and the assistance of indigent tuberculous persons. Such persons are to be cared for in designated hospitals and receive Federal aid where necessary.

NEW YORK DEATH RATE IN 1915.—During the year just closed there were 76,193 deaths reported in the city of New York, giving a death rate of 13.61 per thousand population, which is .03 lower than the rate for 1914. Influenza and the acute respiratory diseases showed an immense increase over 1914, and were responsible for the city not having a lower rate than 13.61 for the year. Twelve thousand people died in the city from influenza and pneumonia during the past year, an increase of almost 1500 over 1914. Estimating the mortality of these diseases as 20 per hundred, there were 60,000 cases of these diseases in the city during the last year. The contagious diseases showed a decrease of 186, despite the prevalence of measles during the early part of the year. The degenerative diseases showed but a slight increase, to wit: 106 deaths. The deaths from cancer were 186 more than during the previous year. This gradual increase in the mortality of cancer has been going on for the past 15 or more years. There was an actual decrease of 94 in the number of deaths reported from tuberculosis. There were 13,872 deaths among infants under one year of age, an increase of 560 over last year. The infant death rate was 99, as compared with 95 last year. This increase in the mortality of children under one year of age was due principally to three causes: Gastro-enteritis, measles and pneumonia. 141,356 births were reported during the year, giving a rate of 25.56 as compared with 140,642 births and a rate of 25.65 for 1914. The marriage rate was lower during the past year than during 1914, the respective rates being 9.11 and 9.67. The number of marriages reported was 50,998 and 53,052. To the financial depression and the loss of immigrants caused by the war, are to be attributed this decrease in the marriage and birth rates.

PUBLIC HEALTH REPORT OF THE SECRETARY OF THE TREASURY.—The annual report of the Secretary of the Treasury as it relates to the Public Health Service, contains numerous recommendations bearing on the functions of that organization and evidences the great interest of this department in the extension and expansion of the governmental agencies for the protection of the public health.

In the development of general public health work, according to the Secretary, there is great need of additional medical officers. The number of requests for advice and assistance in health problems received from states and municipalities during the past year has far exceeded that in any similar period in the history of the Service, but the limited number of officers available for the work has prevented in many instances compliance with these requests.

The field investigations, the Secretary states, have served as a stimulus to state and local health agencies, and every effort should, therefore, be made to encourage and turn to practical

account the interest in health matters awakened in the general public. For this reason, an increase in the appropriation for field work is requested.

An additional building for the Hygienic Laboratory is urgently needed. The work of this institution has been greatly extended, particularly as it relates to the examination of viruses, sera and analogous products, a vast market for which has been recently created abroad. The safeguarding of these therapeutic agents requires great accuracy and precision, and overcrowding is a serious handicap. In order that the public health may be better protected, an annual appropriation of \$25,000 is recommended to be expended in carrying out the provisions of the law relating to the examination of these products.

The United States is the only government of importance which does not provide for the care and isolation of lepers. The establishment of a national leprosarium where the numerous lepers, most of whom are native-born Americans, may be properly segregated and treated, thereby eliminating a menace to the health of others, is urged.

The further recommendations of the Secretary relate to the need of additional clerical assistance in order to meet the demands which are increasingly made on the Public Health Bureau.

IMPROVING CANCER STATISTICS IN THE UNITED STATES.—At the suggestion of a number of the foremost American students of the cancer problem, the United States Bureau of the Census has instituted radical improvements in the collection and publication of the statistics of this disease. A special monograph on deaths from cancer in the United States during the year 1914 is in preparation and will be issued shortly after the first of the year.

This monograph will consist of tables showing the deaths from cancer, according to the site of the disease, age, sex, color, nativity and marital condition, for the registration area, the several registration states and the usual subdivisions. Figures for white and colored will be shown separately for such counties and towns as have a colored population of 10,000 or at least 10 per cent. of the total. The new plan subdivides the seven titles for cancer in the International List of the Causes of Death into twenty-nine headings referring to the exact site of the disease. For instance, all deaths from "cancer and other malignant tumors of the buccal cavity" will now be reported under the separate subdivisions for cancer of the lip, tongue, mouth and jaw, and similarly with the other groups.

Upon the further suggestion of a prominent surgeon, the Census Bureau also plans to increase the accuracy of the statistics by tabulating separately the returns in which the diagnosis was "reasonably certain" and those in which it was "uncertain". In arriving at this distinction a

report is classed as "certain" if the diagnosis was confirmed by microscopical examination of tissues, or by surgical operation, or by autopsy. All cases of internal cancer in which the diagnosis was based on clinical observation alone are classified as "uncertain" regardless of any strength of assertion by the physician that the diagnosis was correct.

STANDARDIZATION OF DENTAL SCHOOLS.—Report from Milwaukee on December 27 announces a plan for the classification and standardization of the dental schools in the United States after the same method as that applied by the American Medical Association to the rating of medical schools. This is to be done by the Dental Educational Council of America whose next annual meeting is to be held at Louisville, Ky., in July, 1916. The announcement is made by a committee which during the year has been inspecting dental schools throughout the country which number a total of fifty-two.

"During the last two months colleges in the West and Middle West have been inspected by the committee. At the last meeting of the council a report was submitted on the standing of the colleges of the South. The inspection of the Eastern colleges will begin April 1, in order to have the complete report ready for the annual meeting. At that meeting also a curriculum for the four-year course in dentistry, which will be adopted in all colleges in 1917, will be submitted to the council.

"Already many schools of dentistry are preparing to meet the requirements of the new classification and the demands of the four-year course. In several cities where there were two or more poorer colleges these schools have been combined to make one first-class institution. New equipment is being installed. Although Marquette Dental School has been rated 'A' for the last ten years by the New York State Department of Education, which was the previous authority on the question, officials of the school have already prepared for the four-year course.

"The Dental Educational Council is composed of five members from the National Association of Dental Faculties, five from the National Association of Dental College Examiners, and five from the National Dental Association."

INCREASE IN COST OF DRUGS.—The rising cost of drugs, which we have noted at intervals since the outbreak of the war, has continued to the very close of the old year and the opening of 1916. Report from New York on December 31 describes as follows the present status of the domestic market for drugs and chemicals:

"The domestic drug and chemical markets passed through the most critical period in their history during the twelve-month just closing. Narrowing supplies of practically all fine medicinal drug and chemical preparations, as well as all technical chemicals, coupled with the

most rampant speculative operations ever seen in this country, brought about an unprecedented upheaval of prices and values which were anywhere from 100 to 5000 fold inflated, bid fair to go still higher as the year closes. The violence of fluctuations seen here towards the close of the year had not only extended to practically all products of European origin, but owing to the fact that ocean transportation rates from such Far East points as India, Ceylon and China had over-topped the high level established last spring, and to the fact that sources of drug supply in Asia Minor, Turkey, Egypt and Japan had not proved as prolific as during normal years, advances had extended to all products obtained from the Near and Far East.

"Additional announcements of contraband of war lists by Great Britain, France, Italy, Germany, Russia and other countries, and the complete embargoes placed by these countries, as well as by their dependencies on a large number of medicinal drugs, as well as upon numerous commodities used in the manufacture of explosives and in munitions for war, brought about a heavy buying movement on the part of domestic handlers."

The table accompanying this statement presents a comparative survey of relative prices of the principal drugs at the beginning and close of the year 1915. During this period, for instance, opium has risen from \$9 to \$11 per pound, quinine from 31 cents to \$2.50 per ounce, antipyrine from \$2.80 to \$32 per pound, balsam of Peru from \$1.70 to \$5.75 per pound, sodium benzoate from 50 cents to \$4 per pound, potassium bromide from 72 cents to \$5.50 per pound, sodium bromide from 56 cents to \$4 per pound, caffeine from \$4.50 to \$12 per pound, Epsom salts from \$1.75 to \$4 per hundred weight, potassium chloride from \$75 to \$600 per ton, potassium permanganate from 15 cents to \$1.75, resorcin from \$1 to \$10.50 per pound, saccharine from \$3 to \$15 per pound, the salicylates from 75 cents to \$4 per pound, thymol from \$7 to \$14 per pound and toluol from 45 cents to \$5 per gallon.

AGE OF TUBERCULOUS INFECTION.—In the issue of the *New York Medical Record* for January 8, is an article by Dr. S. Adolphus Knopf of New York on the relation of age to tuberculous infection, representing an address delivered by him last September before the joint meeting of the American Public Health Association and the annual conference of health officers of the state of New York, at Albany. It is based on responses to sixty letters of inquiry addressed to well-known internists, specialists in tuberculosis and pediatrics. Among the more important conclusions reached by the author from his study of these statistics of the literature and from his own experience may be quoted the following:

Highest Percentage Lowest Percentage

Under 1 year.....	1	9
From 1st to 3d year.....	9	50
From 3d to 5th year.....	27	75
From 6th to 10th year..	34	75
From 11th to 15th year (private)	12	(Hosp. cases) 94

Tuberculous disease in childhood, compared with tuberculous infection, is relatively rare (36%). On the other hand, tuberculous infection is exceedingly frequent, generally speaking. According to exact statistics, as well as general impressions given by men of large experience, the majority of cases of tuberculosis in the adult had their origin in an infection during infancy or childhood.

The frequency of infection increases with the age of the child, and, of course, is also affected by the environments the child comes from.

As to what organs are primarily most frequently involved, statistics and impressions both give lungs and lymph nodes. Prenatal infection, while considered rare, is perhaps much more frequent than statistics show. The age at which a tuberculous infection, contracted in infancy or childhood, becomes active is most frequently at or shortly after 15 years, next between 18 and 30 years. The ages at which tuberculosis was diagnosed and apparently contracted most frequently in later life were given as between 20 and 35 years. Nearly all the authorities consulted unite in the opinion that in order to combat tuberculosis successfully in the young and old alike, we must diminish the sources of infection in childhood.

INSTITUTE FOR TUBERCULOSIS WORKERS.—Attention is called to the Institute for Tuberculosis Workers, which is to be conducted in New York in June of this year by Mr. Philip P. Jacobs, assistant secretary of the National Association for the Study and Prevention of Tuberculosis. It is the first organization of its kind in the United States, and will comprise a three weeks' conference and study of the social aspects of the tuberculosis problem. It will be held under the auspices of the New York School of Philanthropy, 105 East 22nd Street, New York City, from June 1 to 21. The three principal purposes of the Institute are as follows:—

- (1) To train workers to become secretaries or to assume other executive positions in the anti-tuberculosis field.
- (2) To give to all who attend a broad outlook on the tuberculosis field in its national, state, and local aspects.
- (3) To aid in the standardization of methods of anti-tuberculosis work.

The following is a suggested outline of the course, which will, however, be subject to subsequent modifications:

I. Methods of Anti-Tuberculosis Work:

(a) Educational:

- (1) Exhibits
- (2) Publicity
- (3) Literature
- (4) Work with Children
- (b) Organization
- (c) Dispensaries
- (d) Open-air schools
- (e) Industrial Work for Employees
- (f) Nursing
- (g) Institutional Work
- (h) Coöperation with City Officials
- (i) Conduct of Conferences and Meetings

II. Programs of Anti-Tuberculosis Work:

- (a) For a Large City
- (b) For a State
- (c) For Counties and Small Cities and Towns

III. Relations of the Tuberculosis Campaign to other Social and Public Health Movements

The methods of work will be chiefly by round table conference, with discussion prepared and directed by the conductor, who will have the co-operation of prominent tuberculosis workers in New York and its vicinity. The mornings will be devoted to the conferences and the afternoons to visits in various institutions and offices. The only charge for the course is a registration fee of \$10.00. Applications for membership should be addressed to Mr. Jacobs at 105 East 22nd Street, New York City.

EUROPEAN WAR NOTES.

AMERICAN HOSPITAL UNIT IN GERMANY.—The arrival in Berlin of the hospital unit sent out by the American Physicians' Expedition Committee, which left this country for service in Germany, has been reported. The unit was headed by Dr. Fred Kammerer, president of the New York Surgeon's Society, and included three surgeons,—Drs. Frank D. Gorham, P. Sauer and Frank Paschal, with six nurses. The unit will take charge of the military reserve lazaret at Deutsch Eylau, East Prussia.

RETURN OF DR. RICHARD L. JETTS.—Dr. Richard L. Jetts, of Cleveland, Ohio, a member of the British Red Cross, has succeeded in escaping from Serbia, where he was engaged in hospital work, and has returned to this country. Dr. Jetts has served in various parts of Serbia and was at a hospital in Pirov when the Bulgarians and Teutons poured across the Serbian border. As the Serbians retreated, the ambulance corps gathered as many of the wounded as possible together and proceeded to retreat ahead of the army. Many of the wounded could not be moved, because of lack of facilities, and had to be left behind. In the process of moving, everybody was forced to leave behind him everything except the clothes he wore. Dr. Jetts, therefore, made his arrival with no possessions but a sword. The refugees, pursued by the Germans

and Bulgarians, fled south and crossed the Grecian border into Monastir. From here they were able to get to Italy, whence Dr. Jetts sailed home. The ship also contained as passengers Dr. Frank E. Letts of London, Ont., Dr. A. H. Miles of Lancaster, Mass., and Dr. D. M. Sherbrook of Ware, Mass., who had gone to Serbia to aid in fighting the typhus. They had been obliged to walk to Monastir to make their escape from the country.

CHOLERA, SMALLPOX AND TYPHUS IN AUSTRIA-HUNGARY.—The weekly report of the United States Public Health Service for December 24, 1915, states that during the month of October there were in Austria-Hungary 1284 cases of Asiatic cholera with 862 deaths, of which the majority were among the civil population. During the six weeks ended October 16, 1915, there were 2923 cases of smallpox in Austria, and during the fortnight ended October 2 there were 204 cases of typhus fever.

EXPEDITION OF DR. ANDERSON.—It is announced that Dr. John F. Anderson, formerly director of the Hygienic Laboratory of the United States Public Health Service, has sailed for England and France to study there the methods employed in the armies for the prevention of wound infections. He will visit various hospitals to observe the various methods employed both in the prevention and in the treatment of serious wound sepsis.

TYPHUS FEVER IN SIBERIA.—Report from Berlin on December 30 states that typhus fever is extensively epidemic in the military prisons and detention camps of Russia. In Novo-Nikolaiev alone it is said 7000 prisoners have recently died of this disease, whose presence is attributable to deficiency of sanitation.

EXTENT OF FRENCH MILITARY HOSPITALS.—Report from Paris on December 30 states that the military and auxiliary hospitals of France now contain a total of 500,000 beds, the majority of which are occupied by wounded soldiers. The cost of their maintenance is \$250,000 daily. Already the three Red Cross Societies operating in France have spent \$16,000,000 for the 115,000 beds which they maintain in 1200 hospitals. Of this amount, over \$1,250,000 have been contributed from American sources.

WAR RELIEF FUNDS.—On January 8, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$81,274.14
Serbian Fund	60,849.19
Allied Fund	49,152.80
French Fund	35,383.21
Armenian Fund	27,904.45
Surgical Dressings Fund	15,641.99
La Fayette Fund	15,641.99
Polish Fund	14,565.43
Italian Fund	14,330.02

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending January 8 there were 316 deaths reported, with a rate of 21.67 per 1,000 population as compared with 252 and a rate of 17.56 for the corresponding week last year.

There were nine deaths from influenza, and 80 deaths from pneumonia against 36 last year.

There were 44 deaths under one year as compared with 29 last year, and 119 deaths over 60 years of age against 92 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 51; scarlet fever, 53; measles, 59; whooping cough, 63; typhoid fever, 1; tuberculosis, 36.

Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 13; measles, 1; whooping cough, 2; typhoid fever, 1; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 8; scarlet fever, 1; measles, 1; whooping cough 3; typhoid fever, 3; tuberculosis, 18.

The non-residents included in these deaths were: Diphtheria, 4; scarlet fever, 1, measles, 1; whooping cough, 1; typhoid fever, 3; tuberculosis, 1.

NEEDS OF CHILDREN'S HOSPITAL.—Since the removal of the Children's Hospital to its new buildings on Longwood Avenue, it has incurred a large financial deficit, due partly to the increased number of patients for which it has cared, and partly to the increased cost of maintenance in its new quarters. This increase has amounted to more than \$50,000 in its annual expenditures. There is, therefore, need of an immediate fund to be raised by generous public charitable contributions to meet this deficit. The following appeal to the public for this purpose, signed by four members of the staff, has recently been published in the daily press:

"In April, 1914, the Children's Hospital moved from the Huntington Avenue building to the new group of buildings on Longwood Avenue. It moved from a building which had been long ago outgrown, and which by its very unfitness had restricted the work the hospital should have been doing. With the move to the adequate quarters of the new hospital there began an expansion of work, an expansion merely waiting to take place, but prevented by the surroundings and limitations of the Huntington Avenue building. The number of ward beds increased from about 75 to 120 at once on moving, necessitating, of course, more nursing, more heat, more food and more service in all directions.

"In the first nine months of 1913 there were admitted to the wards 1496 patients. In the corresponding nine months of 1915 there were admitted 2542, being an increase of 70%. In addition to this there has been a great increase in the patients coming to the Out-patient Department. In the first nine months of 1913 there were 23,050 out-patient visits. In the corre-

sponding nine months of 1915 there were 35,129, an increase of 12,000, or 52%. This increase means that in each of these nine months there were 1300 more children coming to the hospital for treatment than came in the old building. In October, 1915, there were made 4000 out-patient visits, as against 2380 in 1913.

"The social service department in the first nine months of 1915 showed an increase of 110% in new patients over the corresponding months of 1913, and visits at the homes of the patients in this department in 1915 showed an increase of 30% over home visits in the same period in 1913. Not only in the number of patients cared for has the expense been greatly increased, but also by the higher standard of work naturally resulting from new conditions, adequate quarters, and continuity and association with the Harvard Medical School. More laboratory examinations are available and a better study and better care of patients thereby secured.

"Those of us who had personally known the conditions in the old hospital had expected that under proper conditions a large expansion would occur, but none of us had anticipated so great and so sudden an expansion of work. This greatly increased demand on the hospital has naturally been most expensive, and has come at a time when it is not easy to raise money for home enterprises; but the Children's Hospital deserves support from the community in which it is situated. Its resources are small, it receives no city or state aid of any kind, it is committed by its clientele to an expenditure beyond its present income, its money is honestly and economically spent in the interest of the community, and it confidently looks to that community for financial assistance, without which its present work cannot be carried on.

"HAROLD C. ERNST, M.D.,

"ROBERT W. LOVETT, M.D.,

"JOHN LOVETT MORSE, M.D.,

"JAMES S. STONE, M.D."

Subscriptions should be sent to Mr. Gordon Abbott, Treasurer, Old Colony Trust Company, 17 Court Street, Boston.

In response to the above appeal, about \$800 have already been received in contributions. The inadequacy of this amount has led Mr. Abbott to issue the following second appeal, to which it is hoped there will be an immediate and generous response:

"The Children's Hospital, facing a large deficit, earnestly appeals to you to help meet its running expenses, which have increased by over \$50,000 per annum since the opening of the new hospital.

"This increase in cost is entirely due and in proportion to the larger number of children cared for.

"The demands upon us have increased beyond all expectation. How they have been met is shown in the enclosed report from members of the staff.

"The existing high standard of efficiency should not be, and will not be, lowered; therefore the only way to decrease expenses is to shut our doors to the ill child, or refuse counsel to the frightened mother.

"We receive no help from the government of either state or city; our endowment (derived entirely from gift or bequest) is too small for our present needs, and we depend each year to a great extent upon the generosity of the community, so that every contribution, either large or small, is of vital use."

WORK OF THE ANDROSCOGGIN.—On December 22, the hospital patrol ship *Androscoggin* returned to Boston from her second cruise of the season along the fishing banks, bringing from Shelburne, N. S., one fisherman ill with typhoid fever and another with cardiac disease. Since sailing from this port on December 2 the hospital ship has treated 21 sick or injured fishermen. The custom is being established of making headquarters of the *Androscoggin* off Shelburne whither patients may be brought from all parts of the maritime region. The two patients brought to Boston were sent to the United States Marine Hospital at Chelsea.

FOOT AND MOUTH DISEASE.—Report from Worcester, Mass., on December 22, states that there is a fresh outbreak of foot and mouth disease among 250 hogs on a farm in that city. A strict quarantine of the region has been established by the State Department of Animal Industry.

CHOICE OF SPECIALTIES AT HARVARD MEDICAL SCHOOL.—In connection with the book recently published by the Alumni Association of the Harvard Medical School, giving the experience of recent graduates of the School, it is interesting to note the following statistics recently made up from the senior class of the Harvard Medical School. In its freshman year the class was asked to state the branch of medicine each member intended to choose as a profession. In its senior year the class was again asked to state its preference of specialty. The results are as follows:

	First Year Choice	Fourth Year Choice	Unchanged	Changed
Surgery	17	16	11	6
Internal medicine	5	10	4	1
General practice	10	10	6	4
Pediatrics	5	9	4	1
Gynecology and obstetrics	4	6	2	2
Public health	1	3	1	0
Eye and ear	2	2	2	0
Orthopedics	4	1	1	3
Neurology	7	1	0	7
Genito-Urinary	0	1	0	0
Nose and throat	1	1	1	0
Physiology	2	1	0	0
Pathology and bacteriology	2	0	0	2
X-ray	1	0	0	1
Uncertain	11	5	1	

HEALTH WEEK IN BOSTON.—The week of January 9 to 15 has been appointed Health Week in Boston. The movement is participated in not only by local societies, but state and national organizations. Lectures and exhibitions consisting of models, charts and moving pictures, are held at the Boston Y. M. C. A. building, which has been turned over to the committee in charge of this campaign for education of the public in matters of health. The lectures are free and all are invited. Some of the organizations participating in the movement are the Associated Charities, Milk and Baby Hygiene Association, Boston Association for the Relief and Control of Tuberculosis, City and State Departments of Health, the United States Government, Instructive District Nursing Association, Massachusetts Medical Society, Psychopathic Hospital, Boston Dispensary, Life Extension Institute of New York, Scientific Temperance Federation, Women's Municipal League, Massachusetts Consumers' League, Massachusetts Child Labor Committee, Massachusetts Society for Mental Hygiene and the Maverick Dispensary.

On Sunday Dr. Hugh Cabot made an address on "Individual Responsibility for Community Health." On Monday the Boston Association for the Relief and Control of Tuberculosis held a meeting on "Tuberculosis, Its Prevention and Cure." There was also an address on "The Functions and Service of the City Department of Health," and a symposium on the child by four experts in the health and care of children. On Tuesday there was a presentation of the work of the State Department of Health, a debate on sickness insurance, and a symposium on health problems and the immigrant. On Wednesday an address was given on the diseases of the eye and ear, and on the care of the teeth. On Thursday there will be a presentation by the Scientific Temperance Society and addresses by Dr. Richard Cabot and Professor Seliskar Gunn on "Health Problems and the Social Worker." On Friday E. E. Rittenhouse, President of the Life Extension Institute, will speak on that organization and there will be an address on "Dispensaries and Nursing for the Poor and Not Poor." Moving pictures of "Better Boston" will close the exercises on Saturday.

GRADUATION OF NURSES AT NEW ENGLAND BAPTIST HOSPITAL.—The graduation of nurses of the New England Baptist Hospital will take place in Ford Hall, January 19, at 8 p.m. Dr. Charles A. Porter will speak on "Experiences with the Harvard Unit in France." Diplomas will be awarded to ten graduates.

BOSTON DISPENSARY.—The Boston Dispensary announces that the past year has been its most successful year since its establishment. It treated an average of 404 patients daily, or 122,333 during the year. Of this number 37% were men, 30% were women and 33% children. The

per cent. of men treated is much larger than formerly, due, it is believed, to the depression of industrial conditions in the early part of the year.

MASSACHUSETTS GENERAL HOSPITAL TRAINING SCHOOL.—Invitations are issued by the trustees of the Massachusetts General Hospital for the graduating exercises of the Training School for Nurses, on Thursday evening of this week, January 13. The principal address on this occasion will be delivered by Dr. George Cheever Shattuck on "Serbia; Its Hospitals and Nursing Conditions."

MEDICAL BEQUESTS.—The will of the late Mrs. Moses G. Howe, of Cambridge, Mass., who died in that city on Jan. 3, was filed on Jan. 16 in the Middlesex registry of probate. It bequeathes her house and land for the joint use of the Cambridge Hospital and Home for Aged People, and contains a legacy of \$3000 to the trustees of Boston University for the foundation of a scholarship in its school of medicine.

SUMMARY OF BOSTON VITAL STATISTICS FOR 1915.—Deaths reported before January 7, 1916, for 1915, were 12,018.

Deaths of non-residents numbered 1,610 against 1,544 in 1914, and known deaths of Bostonians outside of the city numbered 704 against 768 in 1914. Corrected for these two factors, the 1915 death rate per 1,000 population is 14.85 against 15.01 in 1914.

A few provisional figures for 1915 are given below:

CASES, DEATHS AND DEATH RATES PER 100,000 OF POPULATION.

Cases.	Deaths.	Death Rate.	1914		Lowest Death Rates.	
			Rate.	Year.	Rate.	Year.
Typhoid fever	388	40	5.3	9.0	1912	8.0
Diphtheria	2942	218	29.1	22.9	1912	14.3
Scarlet fever	2959	79	10.6	8.8	1912	4.5
Measles	5175	40	5.3	8.4	1879	.6
Pulmonary						
Whooping cough	2190	111	14.8	6.2	1905	4.9
Pulmonary tuberculosis	2820	1031	137.8	141.9	1914	141.9

The above table shows in 1915 new record low death rates for both typhoid fever and pulmonary tuberculosis. Attention should be called to the fact that included in the above totals were the following deaths of non-residents:—

Typhoid fever	9
Diphtheria	54
Scarlet fever	26
Measles	4
Whooping cough	2
Pulmonary tuberculosis	82

From typhoid fever nine non-residents died in Boston and four Bostonians died outside. And from pulmonary tuberculosis 82 non-residents died in Boston and 191 Bostonians died outside, so that corrected 1915 death rates per 100,000 population for these two diseases are respectively 4.7 and 152.3.

Deaths under one year numbered 2,032 against 2,007 last year.

Births in Boston reported before January 7 numbered about 19,600, while the final total for 1914 was 19,463. Mr. McGlenen, City Registrar, estimates that about 100 more will be reported for the year. The infant mortality rate in that case will be 103, or equal to the record rate of 1914.

OTHER COMPARISONS FOR 1914 AND 1915.

Causes.	Total Deaths.	Total Deaths.	Non-Resi-	Non-Resi-
	1915.	1914.	dents.	dents.
	1915.	1914.	1915.	1914.
Total deaths from all causes	12,018	11,831	1610	1544
Anterior poliomyelitis	4	7		2
Cerebrospinal meningitis	30	39	7	3
Glanders	3	3		
Malignant pustule	2		1	
Tetanus	7	10	4	7
Other tubercular	187	219	34	52
Accidental and violent	818	833	143	161
Bright's disease and nephritis	837	822	64	69
Bronchitis	127	117	6	2
Cancer	853	879	149	166
Diarrhea and enteritis under two	451	480	69	119
Diarrhea and enteritis over two	76	69	18	11
Dysentery	12	26	2	6
Erysipelas	48	50	5	4
Heart disease	1608	1882	131	155
Meningitis and encephalitis	66	51	11	5
Old age	25	23	2	
Pneumonia	1460	1385	114	107
Premature birth	355	422	51	55
Puerperal diseases	156	127	40	19
Rheumatism	32	36		2
Total deaths under 1 year	2032	2007	318	328
Total deaths under 5 years	2959	2774		
Males	6296	6260	888	863
Females	5721	5571	721	681
Hospitals and institutions	5478	5140	1432	1322
Over 60 years of age	3632	3438		
Colored	364	370		

Correspondence.

THE HOSPITAL AND THE GENERAL PRACTITIONER.

Dec. 25, 1915.

Mr. Editor: Regarding Dr. Cabot's letter in this week's JOURNAL, it seems to me that Dr. Cabot should have written to the daily papers a denial of the statements which he was reported to have made at the Evans Memorial. This would have been an easy matter, as Dr. Cabot has a most free entry into the columns of the daily press, and this would in a measure have partly offset the considerable harm to the profession and the public which resulted from the publication of Dr. Cabot's alleged address.

Unfortunately, it has been the practice of Dr. Cabot, in his addresses to the laity, to disparage the work of the general practitioner. He has made the statement that sick persons who are treated free at the hospitals and dispensaries receive better care than those who patronize a local physician. Such a statement is at absolute variance with the truth, and every physician who has gone through the clinics at the different hospitals and dispensaries in Boston knows the statement to be at variance with the truth.

The people, however, do not know, and a great many of them look to Dr. Cabot for advice, through the press, on medical matters. In consequence, throngs attend the different out-patient departments who are perfectly able to pay a physician. The result is a pauperizing effect on the community.

Dr. Cabot gives an address with this or a similar heading: "Better Medical Care, Cheaper." The idea is, I understand, to have a general clearing house of specialists which will entirely eliminate the common doctor.

With the active competition of the various municipal and endowed hospitals of the city, the lot of the ordinary physician is becoming intolerable, and it will not improve until a radical change is made in the conduct of the municipal and endowed hospitals; until they are made to serve the physician and the public with a proper regard for the rights of all concerned.

Very truly yours,

CHARLES MALONE, M.D.

5 Glen Road, Jamaica Plain.

[NOTE.—The letter from Dr. Cabot, which was printed in the issue of the JOURNAL for Dec. 23, was originally written by him for publication in the daily press, but was refused.—EDITOR.]

THE USE OF BACTERINS IN DERMATOLOGY.

BOSTON, DEC. 23, 1915.

Mr. Editor: In the December 16th edition of the JOURNAL one may read on page 910 the following words: "The attention of the writers was attracted by the number of cases of chronic pyogenic dermatoses in the Skin Clinic of the Massachusetts General Hospital, in which, it seemed to them, the results were unjustifiably poor. Investigation developed the fact that the 'failures,' almost without exception, had been treated solely by external methods of various kinds for considerable periods of time. It was rarely that a case was found in which bacterin therapy had been used."

These words are true as far as they go, but in justice to the members of the Skin Department of the hospital, I would like to make the following statement: From the beginning of "vaccine" therapy the skin staff has made use of appropriate bacterins in the treatment of skin diseases. These bacterins have been made and administered by various members of the pathological staff appointed for this sole purpose, while many and various "stock" vaccines have been injected by different members of the skin staff. The results, except in furunculosis, throughout these years have been uncompromisingly poor, not only in the Massachusetts General Hospital, but in the practice, both public and private, of most dermatologists in America. A few men, in the writer's experience, have succeeded and have continued this type of therapy, but most men have felt obliged to abandon this field defeated. In other words, the ability to succeed in the making and administering of bacterins is a gift of the Gods, like the ability to use x-rays successfully in skin therapy,—a few have succeeded, but the great majority has failed and given up the attempt.

When Dr. Dennie came to the skin clinic of the Massachusetts General Hospital he was assigned the task in which so many predecessors had failed, and he soon demonstrated to our great satisfaction that he was one of the chosen few. His results are now tabulated and it is only proper to record here our great disappointment when his time of service was completed, and he decided to return to Kansas City to take up his permanent abode.

Respectfully yours,

CHARLES J. WHITE, M.D.

A HERO REWARDED.

PARIS, Dec. 15, 1915.

Mr. Editor:

It my letter of November 13 found any readers, they may be interested to hear that the pink and white English lad therein mentioned as having passed from the tennis-lawns of his native land into the very midst of the hard fighting in Champagne toward the end of last September, when for three consecutive days and nights he ran a motor ambulance under fire over a three kilometer beat between the trenches and the guns, has been mentioned in French army orders and proposed for the cross of war for conspicuous gallantry. The curious part of it all is that when he told me about it he didn't appear to think that he had done anything special, and certainly never dreamed of the honor that was to fall to his lot. His car was hit several times, but he himself came through without a scratch.

"S."

Miscellany.

UNITED STATES PUBLIC HEALTH SERVICE.

EXAMINATION OF CANDIDATES FOR ASSISTANT SURGEON.

Boards will be convened at the Bureau of Public Health Service, 3 "B" Street, S. E., Washington, D.C., and at a number of the Marine Hospitals of the Service, on Monday, January 24, 1916, at 10 o'clock a.m., for the purpose of examining candidates for admission to the grade of Assistant Surgeon in the Public Health Service.

The candidate must be between 23 and 32 years of age, a graduate of a reputable medical college, and must furnish testimonials from two responsible persons as to his professional and moral character, together with a recent photograph of himself. Credit will be given in the examination, for service in hospitals for the insane, experience in the detection of mental diseases, and in any other particular line of professional work. Candidates must have had one year's hospital experience or two years' professional work.

Candidates are required to certify that they believe themselves free from any ailment which would disqualify them for service in any climate. Examinations are chiefly in writing, and begin with a short autobiography of the candidate. The remainder of the written exercise covers the various branches of Medicine, Surgery and Hygiene.

Successful candidates will be numbered according to their attainments on examination, and will be commissioned in the same order. They will receive early appointments. After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon. Passed Assistant Surgeons after twelve years' experience are entitled to examination for promotion to the grade of Surgeon.

Assistant surgeons receive \$2,000, passed assistant surgeons \$2,400, surgeons \$3,000, senior surgeons \$3,500, and assistant surgeon-generals \$4,000 a year. When quarters are not provided, commutation at the rate of \$30, \$40, and \$50 a month, according to the grade, is allowed. All grades receive longevity pay, 10% in addition to the regular salary for every five years, up to 40% after twenty years' service. The tenure of office is permanent. Officers traveling under orders are allowed actual expenses. For invitation to appear before the board of examiners, address "Surgeon-General, Public Health Service, Washington, D. C."

NOTICES.

MASSACHUSETTS STATE WASSERMANN LABORATORY.—The State Department of Health has established a

Wassermann Laboratory in Building D, Room 103, 240 Longwood Ave., Boston. This Laboratory offers free Wassermann service to State, county, municipal, public and private institutions and hospitals, local boards of health, and to private physicians. With regard to private physicians, specimens for examination must be submitted by direction of a State district health officer who will furnish the necessary outfits, or patients must be sent directly to the Wassermann Laboratory unless the physician's local board of health has made arrangements for submitting such specimens.

It is desirable to have local boards of health take advantage of free Wassermann tests in order to make the service equally accessible to physicians in all parts of the State.

For further particulars address

STATE WASSERMANN LABORATORY.

THE HARVEY SOCIETY.—The fifth lecture of the series will be given at the New York Academy of Medicine, 17 West 43rd Street, on Saturday evening, January 15, 1916, at 8.30 o'clock, by Dr. Donald D. Van Slyke, The Rockefeller Institute for Medical Research. Subject: "The Present Significance of the Amino Acids in Physiology and Pathology."

NEW ENGLAND OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.—Meeting of the Society will be held on Tuesday, January 18, at the Boston Medical Library, at 8 p.m.

1. "Report of Two Cases of Retrobulbar Neuritis," Dr. Leon E. White, Boston.
2. "The Value of Bone and Cartilage Transplants in Rhinological Surgery," Dr. William Wesley Carter, New York.

WILLIAM F. KNOWLES, M.D., *Secretary*.

CHILDREN'S HOSPITAL.—Clinical Meeting. The visiting staff of the Children's Hospital will hold a clinical meeting at the hospital, Friday, January 21, 1916, at 4.30 p.m. Physicians and students are invited.

HAROLD C. ERNST, M.D., *Chairman*.

APPOINTMENTS.

At the last meeting of the President and Fellows of Harvard College in 1915, the following appointments and reappointments in the Harvard Medical School were announced:

- George R. Minot, M.D., assistant in medicine.
 Harry Linenthal, M.D., assistant in medicine.
 Harold Bowditch, M.D., assistant in medicine.
 Ernest Grey, M.D., assistant in surgery.
 Albert Ehrenfried, M.D., assistant in surgery.
 Robert B. Osgood, M.D., instructor in surgery.
 Raymond S. Titus, M.D., alumni assistant in obstetrics.
 William R. Osler, M.D., Austin teaching fellow in bacteriology.
 John K. Wright, M.D., assistant in military science.
 Francis W. Peabody, M.D., consulting physician to the Collis P. Huntington Memorial Hospital.
 Edward H. Risley, M.D., assistant surgeon to the Collis P. Huntington Memorial Hospital.
 Henry Lyman, M.D., research fellow in chemistry of the cancer commission of Harvard University.

BOSTON DISPENSARY.—New appointments for the year 1916 are as follows:

- Stephen Rushmore, M.D., surgeon, gynecological department.
 Harold B. Eaton, M.D., physician, nerve and mental department.
 E. J. Kelley, M.D., assistant to the physicians, medical department.
 A. F. Browne, M.D., assistant to the physicians, medical department.

Fred C. Gunter, M.D., assistant to the physicians, medical department.

Margaret Grogan, M.D., assistant to the physicians, medical department.

I. W. Jacobs, M.D., assistant to the physicians, children's department.

Raymond S. Titus, M.D., assistant to the surgeons, gynecological department.

Foster S. Kellogg, M.D., assistant to the surgeons, gynecological department.

Paul J. D. Haley, M.D., assistant surgeon, eye department.

John A. Reese, M.D., assistant to the surgeons, genito-urinary department.

David Williams, M.D., assistant to the surgeons, genito-urinary department.

Promotions for the year 1916:

Charles H. Hare, M.D., (formerly surgeon) consultant surgeon, gynecological department.

Malcolm Storer, M.D., (formerly surgeon) surgeon-in-chief, gynecological department.

Robert L. DeNormandie, M.D., (formerly assistant surgeon) surgeon, gynecological department.

John B. Swift, M.D., (formerly assistant to surgeon) assistant surgeon, gynecological department.

John T. Williams, M.D., (formerly assistant to surgeon) assistant surgeon, gynecological department.

Clarence G. Lane, M.D., (formerly assistant to physician) assistant physician, dermatological department.

Elmer S. Bagnall, M.D. (formerly assistant to physician) assistant physician, medical department.

FORDHAM UNIVERSITY.—The reorganization of the staff of the departments of physiology and biochemistry results in the appointment of Lewis W. Petzer, Ph.D., M.S., professor of physiology and biochemistry; George F. Sheedy, Ph.B., M.S., assistant professor of physiology; Carl P. Sherwin, M.S., Ph.S., assistant professor of biochemistry; John A. Killian, A.B., A.M., instructor in physiology and biochemistry.

RECENT DEATHS.

DR. JOHN GEORGE DEARBORN, a retired Fellow of the Massachusetts Medical Society, died at his home in East Boston, January 3, 1916. He was a graduate of the New York University Medical College in 1858, and settled in East Boston in 1872. During the Civil War he was assistant surgeon in the United States Navy. For many years he was surgeon to the State Prison at Charlestown. He is survived by a widow and one daughter.

DR. JOSEPH J. O'CONNELL, health officer of the port of New York, died of myocarditis at his home in the quarantine station, Staten Island, on January 2, at the age of 49. He was a graduate of the Long Island College Hospital, and was for many years the sanitary inspector in charge of the contagious disease bureau of the Brooklyn board of health. On February 1, 1912, he was appointed health officer of the port of New York and among the results of his administration is the quarantine pathological and bacteriological laboratory which is considered one of the finest in the world. He effected many radical changes in the administration of the department and during the typhus visitation of New York harbor in 1914, he won a wide reputation for his work of sanitation. His plan has since been adopted by the German and other government medical authorities of Europe. He is survived by his widow, a daughter and two sons.

DR. GEORGE THOMAS JACKSON, formerly professor of dermatology at the College of Physicians and Surgeons of Columbia University, died in New York at 64 years of age. Dr. Jackson was professor of dermatology at Vermont University from 1895 to 1897, and was the author of several medical text-books. His use, in 1909, of liquid air as a therapeutic agent attracted wide attention.

The Boston Medical and Surgical Journal

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Therapeutic and Preventive Medicine.

THE TREATMENT OF NEPHRITIS.*

By CADIS PHIPPS, M.D., BOSTON,

Second Assistant Visiting Physician of the Boston City Hospital (Third Medical Service); Assistant Professor of Medicine at Tufts Medical School.

It may sound too general to speak of the treatment of nephritis as a whole rather than specifying the different types. However, although in the majority of cases we may (and do) differentiate between chronic and acute,—and although it is either the interstitial or the parenchymatous tissue which is chiefly involved, yet we really never find the pathological process affecting one form of tissue only and the other remaining perfectly sound. Furthermore, nephritis is not a sharply localized condition, such as an abscess or a fracture, but is either a cause of disturbance in other organs; or is coincident with lesions elsewhere; or is caused by some pathological condition affecting other tissues as well. For example, nephritis is causative of a train of symptoms from its effects on other organs (such as optic neuritis); as an example of the second possibility our term "cardio-renal" brings up a more or less distinct picture in our minds, showing the possible co-existence of lesions in both heart and kidneys; and, lastly, I merely have to mention chronic interstitial nephritis to demonstrate that a diseased kidney may be secondary to the sclerosed condition of the tissues of the circulatory system and indeed of the

whole body. Therefore, it is eminently fitting that we consider *treatment* rather than *cure*, and that we study the patient's general condition as well as his nephritis.

Disease of the kidneys was recognized among the ancients and certain principles of treatment, such as purging, bleeding, and, to a certain extent, diet, date back to the earliest days of medical science. In fact it may be said that in a way comparatively little has been added except in nature of elaboration, especially in the details of diet. To be sure, methods of diagnosis have become more exact,—as the chemical and microscopic examination of the urine and our tests of the functional ability of the kidney with phenolsulphonaphthalein. Most recently we have seen the practical application, in the work of Ambard, Weil, Folin, and others, of Ambard's law that the excretory power of the kidney follows definite rules which are capable of numerical expression.

Because the kidney is one of the excretory organs of the body, our first thought in disease is usually to relieve it by transferring as much of its work as possible to other organs of elimination, such as the bowels, skin, etc. This is particularly true, because prevention is out of the question in practically all of the cases we meet. We can, of course, in acute infectious cases employ such drugs as hexamethylenamin and salol for the purpose of disinfecting the urinary tract, and in the so-called idiopathic cases (usually due to the *bacillus coli communis*) we may derive some benefit thereby. Surgical measures such as capsule-splitting and decapsulation are of demonstrated value in selected cases.

* Read before the Merrimack County Medical Society at Concord, N. H., October 12, 1915.

Bleeding and lumbar puncture are methods of symptomatic treatment, particularly in uraemia but they are of use *only* in the sthenic form where the systolic blood-pressure is as high as 200 mm. In the asthenic type of uraemia hot packs, hot enemata, and pituitrin are of chief value. Increased elimination through the bowels is of the greatest value. Of course by that I mean not merely purging of a uraemic and oedematous patient but also the careful daily attention to the bowels in the chronic cases.

The second method of affording relief to the diseased kidney is to make elimination as easy as possible largely by regulating the diet, and in this, probably, lies our greater interest. The "salt-free" diet we need not consider at great length, as its uses are restricted and it is applicable chiefly to the reduction of oedema. That it may be followed too rigorously we should recognize, however. This was brought to my mind most forcibly a few years ago by a case which I regret I cannot describe more exactly.

The patient was a woman of about 50 years, who had an interstitial nephritis and also a mitral insufficiency. About three months previous to my seeing her she had been placed upon a strict salt-free diet with the idea of reducing her marked oedema. This object had been accomplished to a great extent and the patient was still following the diet faithfully. She was also getting digitalis and strychnia. Although there were no definite changes in her heart or kidneys, the patient had been getting steadily worse for the past two or three weeks, the striking feature beside her increasing weakness being her marked mental failure (her memory became exceedingly poor, she gradually lost power of recognizing people, and what had at first been apprehension and irritability, developed into hallucinations and even a tendency to violence). One striking feature in her physical condition (and practically the only definite change noted) was her tongue, which had become deep red and dry, and had markedly enlarged papillae—it was the tongue seen in sepsis and in arsenic poisoning. Previous to her mental breakdown and during most of her lucid intervals since, she had complained of her diet and had begged for salt. Because of her apparently hopeless condition she was allowed a liberal amount of salt and almost immediately began to improve. I was unable to follow her afterwards, but I do know that she spent last summer at the shore and was able to enjoy motoring, driving, etc.

A diagnosis of "salt-starvation" was certainly logical in this case.

It is in the more general principle of reducing the protein part of the diet that our chief interest lies, but we have fallen perhaps too much into the habit of thinking of diet in terms of calories and the number of grammes of carbohydrates, etc., forgetting the variations and idiosyncrasies of different individuals. Indeed, we are prone to be too much impressed by the disease and so neglect the patient. Also, with all our precision it may well be that our system of dietetics is but a half truth, and that

further research will change many of its apparently basic principles.

Last June in the Shattuck lecture* before the Massachusetts Medical Society, Dr. Joel E. Goldthwait discussed, among other things, the *type* of the individual as having a direct relation to diet. Briefly, he suggested that the carnivorous type required a greater relative amount of proteid than could be tolerated, with the best results, by the herbivorous type. Whether these suggestions are capable of universal application, it is too soon to say, but that they possess value is indicated in some of the cases which we see almost daily. At any rate, we must not adopt so rigorous a system of diet in our eagerness to combat the disease that the patient suffers from his treatment as well as from his nephritis.

That a business or professional man of middle age who shows the slightest possible trace of albumin in his urine with an occasional hyaline cast, and whose systolic blood-pressure ranges about 180 or 190 mm. of mercury, is not going to be improved on diet of bread and milk it is needless to say. Indeed, restricting the protein intake to 75 or 80 grammes daily may prove too small for certain individuals to produce the best *general* results. As an example, however, of benefit coincident with (if not due to) an increase in the protein allowed, the following case is mentioned briefly:

The patient was a boy fourteen years old, who entered the Hospital with an acute nephritis, probably of about three weeks' duration, and due to a severe tonsillitis immediately preceding. His urine was high colored, showed a large trace of albumin, and, under the microscope, the fields were covered with erythrocytes, and also numerous leucocytes, renal cells and hyaline and granular casts. His systolic blood-pressure was 175 and his diastolic, 150. He was put upon our "acute nephritis diet," which is largely milk and cream, containing only about 35 grammes of protein. At the end of seven weeks of this diet and being kept in bed, his condition was practically unchanged. His systolic blood-pressure had fallen to 135 but his urine still contained a large trace of albumin with the same microscopic findings as at entrance.

Partly with the idea of experimenting, I tried increasing his protein, first by adding one cup of broth (about eight grammes) daily. As his urine within two or three days began to clear, I added other proteids until he was eating the ordinary diet,—eggs, meat, fish, etc. Within three weeks his urine showed only the slightest possible trace of albumin with a rare erythrocyte and very rarely a hyaline and finely granular cast. The marked improvement (particularly in his general condition) during the three weeks of liberal dieting, as compared with the seven weeks during which his condition remained absolutely unchanged, is at least suggestive of the virtue of more latitude in our method of dieting.

Besides these methods of reducing the work of the kidney either by lessening its burden or by transferring a part of the load to other organs, the possibility of increasing elimination

* See JOURNAL, June 17, 1915, Vol. cxcii, p. 881.

through the kidney itself is suggested, and here we must go back a step before the process of elimination. In other words, we must consider the *metabolism* of the body and what methods we may have of influencing it. In thyroid extract we possess a drug which profoundly affects the body's metabolism. It causes a loss of weight; it increases the output of nitrogen in the urine (by increasing the waste-products of the body-proteids); it increases the oxidation of fats and carbohydrates; and hastens the elimination of fluid from the body by its diuretic action. (This diuretic action is probably due to the increased excretion of urea). Also it lowers the blood-pressure at the same time accelerating the pulse-rate.

In spite of the experimental work done in establishing these facts of its effect on the elimination of urea, etc., no application to the treatment of nephritis was made of thyroid extract, to my knowledge, until, in 1912, J. F. Percy presented a series of 35 cases in which he had administered it with striking results.¹ His first case was a man weighing over 200 pounds, whose urine showed 4% of albumin, with numerous hyaline and granular casts, and who also had a large cystic goitre. Coincident with this patient's taking thyroid extract for his goitre, Dr. Percy noted that his nephritis, which had hitherto resisted treatment, began to show marked improvement, so that at the end of about a month his urine contained no albumin and no casts. This led Percy to use thyroid extract in large doses on all his nephritics, the cases being "taken as they come," to use his expression, and irrespective of the stage or type of the disease. He summarized his results by saying that "all have responded in the same remarkable way and none has died." In a later paper² he added to his list of cases and recommended the use of this drug in preparing nephritics for operation.

During the past three months I have tried administering thyroid extract to some of my cases of nephritis at the Boston City Hospital, but I did not have sufficient courage to employ the large doses suggested by Percy. Although my results were not uniform and although the study of the patients was necessarily incomplete in some instances, yet almost every case showed certain phenomena which were notable and at least *suggestive* of beneficial results of the medication. (I use the phrase "*suggestive* of beneficial results" advisedly, for in the first case of which I shall speak, the patient could not tolerate the drug, apparently.)

He was a man of 39 years, rather poorly developed and nourished. He showed moderate dyspnea and orthopnea, and was cyanotic. His lungs showed a moderate amount of oedema. His cardiac dullness extended from four cm. to the right of the mid-sternal line to 13½ cm. to the left. It was regular, both second sounds were accentuated and there was a loud blowing mitral murmur. His systolic blood-pressure at entrance was 225 and his diastolic 90. His urine showed a trace of albumin with many

blood and renal cells and numerous casts of different kinds. With phenolsulphonphthalein his renal function was found to be 16% at the end of two hours. His blood urea (nitrogen) was 35.5 mgm. per 100 cc.; his nitrogen index was 15% and his chloride retention .335 gm. per liter. He had moderate oedema of the legs. That his nephritis was of long standing (years) was shown by his history, and also by the presence of a marked optic neuritis.

He was given thyroid extract only after the ordinary methods of diuresis and purgation and the administration of digitalis and nitroglycerine had failed to cause any definite improvement. Following the administration of two grains of thyroid extract three times a day for two days, his systolic blood-pressure had fallen to 130. The albumin in his urine decreased to a slight trace and the cellular elements were noticeably fewer. However, his pulse had risen to 110 from 85 and he complained of weakness, headaches and fluttering of his heart, and so the drug was omitted. A week later thyroid extract was again tried, this time the maximum daily dose being grains three. It had to be omitted again, however, after less than a week, because of the return (in lesser degree) of his headaches and weakness. It had evidently had less effect on him this time, as his pulse had varied but little and his blood-pressure, which had risen again to 238, remained 200 or over during the rest of his stay in the hospital. His urine, however, had almost entirely cleared up during this second attempt at thyroid medication, and showed only the slightest possible trace of albumin with *very* few cellular elements.

In the next case, which I shall consider briefly, the results in the patient's general condition and appearance were more striking, but they were less definite in absolute clinical findings.

He was a male, 18 years old, and the only etiology we could discover for his nephritis was "fever and convulsions" occurring at four years of age. He was moderately prostrated, and had some dyspnea. His heart measured four cm. to the right of the mid-sternal line and 15 cm. to the left, but no murmurs were heard. He had considerable thickening of the radial arteries; his systolic blood-pressure was 200 and his diastolic 150. His urine was that of a chronic interstitial nephritis with the slightest possible trace of albumin, no erythrocytes and only an occasional hyaline cast. He was passing about 2500 cc. in the 24 hours. He was kept in bed on a strict nephritic diet, but left after two weeks, against our advice, having made practically no improvement.

A week later he returned, showing more marked dyspnea and orthopnea, and complaining of nausea, and some vomiting, vertigo, blurred vision and marked headache. His urinary findings were the same as before. With phenolsulphonphthalein his renal function was found to be *nothing* at the end of two hours. He was given thyroid extract beginning with one grain three times a day, and increasing it daily until he was getting four grains three times a day. Within a week his renal function had reached nearly 10% in two hours and his general condition had improved marvelously. His headache, vertigo and nausea disappeared rapidly, as did his uraemic appearance, leaving him bright and cheerful. On account of his rising pulse-rate, the thyroid was omitted, and within two or three days he

had lapsed into his former condition. Twice since then thyroid has been given him with the same marked improvement in symptoms, and twice, also, has it been omitted because of its apparent toxic effect on his heart.

The next case was a man of 20 years, who entered the Hospital with a severe polyarticular arthritis, the infection having entered probably through his tonsils, which were large and ragged, and had crypts filled with exudate. At the end of a week his joints had cleared up under salicylates, but he then had an acute nephritis, with a trace of albumin, considerable blood, some pus, many renal cells and casts in his urine. His heart measured 2 cm. to the right of the mid-sternal line and 12 cm. to the left; the action was regular; the sounds were clear and there were no murmurs. His systolic blood-pressure was 130 and his diastolic, 85. The rest of his physical examination showed nothing abnormal except moderate oedema of his legs. He was put upon a diet restricted to about 40 grammes of proteid and was given free catharsis.

At the end of six weeks he had made no progress toward improvement except for a decrease in the amount of blood and pus cells in his urine, and so thyroid extract was given in daily increasing doses until he was getting five grains three times a day. Within three weeks his renal function had increased from less than 5% in two hours to about 25%. His blood urea nitrogen dropped from 51.25 mgm, per 100 cc. to 30.25 mgm, in 100 cc.; his nitrogen index increased from 5.9% to 16.6%; and his chloride retention from .093 to .277 gms. per liter. His blood-pressure remained the same. His oedema disappeared.

He left the Hospital against advice, returning four days later with considerable oedema of his legs, but otherwise practically the same. His renal function, determined by phenolsulphonephthalein, was then about 15% at the end of two hours. He was given 15 grains of thyroid extract daily and put to bed. At the end of five days his oedema had entirely disappeared, and two days later he was allowed up and about the ward with no ill effects. Within two weeks after entrance his renal function was 32% at the end of two hours. Incidentally, he was allowed a liberal diet practically since the beginning of his thyroid medication.

Two other cases showed rapid disappearance of their oedema coincident with their getting thyroid extract, one case being particularly striking, as he had shown very slow improvement while in the Hospital with a previous similar attack.

One case recovered from uraemia, whereas he had been growing steadily worse and apparently was moribund until thyroid extract was added to his treatment.

Another discharged patient who returned weekly to the Hospital for observation showed a fall in systolic blood-pressure from 195 to 150, but discontinued his thyroid extract himself because of a "fluttering sensation" in his heart.

None of the cases has died.

The cases cited above are far too few in number to be of service in drawing any very definite

conclusions, but certain things are surely suggested by them:

1. Any rigorous system of diet may (*but should not be*) so strict or continued so long that it may be distinctly harmful to the individual case.

2. More freedom in the allowance of protein than is recommended in the "text-book" nephritic diet may be of apparently great advantage in the individual case.

3. Thyroid extract has, perhaps, a great value in the treatment of nephritis, one of the commonest and, at the same time, one of our most hopeless diseases.

4. If given carefully, the administration of the drug is safe.

5. Thyroid medication in nephritis should receive more attention than has heretofore been accorded it.

My thanks are due to Dr. John L. Ames for his help with cases, particularly the one of "salt-starvation." The Ambard tests were done at the Peter Bent Brigham Hospital.

REFERENCES.

¹ Percy, J. F.: Thyroid Extract in Nephritis, Jour. Am. Med. Assn., Nov. 9, 1912, p. 1708.

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Original Articles.

THE INJURED EMPLOYEE AND THE WORKMEN'S COMPENSATION LAW. RESULTS OF IMPARTIAL EXAMINATIONS.*

By FRANCIS D. DONOGHUE, M.D., BOSTON,

Medical Adviser to the Industrial Accident Board of Massachusetts.

THE establishment of the workmen's Compensation Act in Massachusetts has brought into existence not only a new method of adjudicating claims for industrial injuries, but also has created synchronously a new and broader field for expert medical service. Two important objects of this law are as follows:—

First.—Injured employees should receive the best medical treatment possible, whereby they may be returned to industry with the least delay.

Second.—Compensation should be paid promptly, when an injury "arises out of and in the course of employment;" should be continued during incapacity for work; and should not be paid when there is no connection between disability and the occupation, or when there is no disability remaining.

As an active force in fostering the spirit of

* This statement was prepared by Dr. Francis D. Donoghue, Medical Adviser, at the request of the Industrial Accident Board, and will appear later with reports of other impartial physicians in the form of a report to the Massachusetts Legislature.

this law the medical profession has the opportunity of rendering a great service. Under the law the Industrial Accident Board has the power of appointing impartial physicians whose advice is taken by the Board on medical questions having to do with treatment, the relation between injury and death, or incapacity, and the cessation or continuance of disability. The majority of cases referred to impartial physicians have involved in them an element of dispute between the insurance company and the injured employee or his dependents. In those cases where one or both of the parties are relying on the opinion of a physician, the opinion of the impartial examiner must be carefully formed. When a physician gives wrong advice in perfectly good faith there is raised a point of dispute which otherwise probably would not occur. This results in friction, delay and injustice to one side or the other.

A clear statement of what is found, a correct diagnosis and the visualization of an injured employee as he is, under working conditions, are essentials to the sort of medical report which is necessary in passing upon cases under the act.

Anything short of this when acted upon, for the time taken in arriving at the true situation, decreases the efficiency of the administration of the act. For every report of this nature which is eliminated efficiency is increased.

From observation in numerous cases examined as an impartial physician prior to becoming medical adviser, certain reasons stand out as an explanation of the absence in some cases of a proper diagnosis, or of the proper application thereof.

Those reasons which stand out as being worth special emphasis are stated below:—

1. In giving treatment there is a possible tendency to overlook details and the relationship of various existent factors which later may be extremely important in passing upon subsequent conditions.

2. A habit of mind acquired from examining cases under the old law in effect prior to the Workmen's Compensation Act may tend to inhibit that process of deductive reasoning so essential under the theory of a compensation system.

3. There is danger in failing to realize that a surgical cure is not necessarily a functional cure; or when this fact is grasped, in not making the matter clear in the report.

4. When there are pre-existing conditions of infirmity the real effect of the injury may be given too great or too little weight.

5. The importance of occupational diseases and other forms of incapacity due to working conditions and materials is not always realized. In these cases considerable care is required to determine whether the industry is the primary or secondary cause of disability, or in no way responsible.

6. At times the conditions as found may not

be all reported, on the assumption that there is no relevance from a legal point of view. Although a knowledge of the act is essential to the best type of report, any assumption that tends to obscure medically what appears to be extraneous legally is beyond the scope of the examiner's duties, and sometimes leads into error.

By and large, the elimination of those causes which increase rather than decrease the number of disputes between the parties under the Workmen's Compensation Act is highly essential. Costs of administration must be kept within reasonable bounds. Insurance companies desire, and should be aided in every way, to understand and to discharge fully their obligations under the law. Injured persons should not be misled into believing that they are more injured than the facts really show. The importance of having these principles carried out is doubtless recognized by all. The medical profession is in a position to be of incalculable service to the successful administration of the act passed by the Legislature for the benefit of the employees of the Commonwealth. Much valuable work has been done, but the aim should always be in the direction of still greater accomplishment.

Certain cases which have come to the attention of the writer while acting in behalf of the Board as impartial examiner and voluntary adviser may prove of interest and value in connection with the subject under discussion. A few of these cases are as follows:—

CASE H. L. In this case the insurance company had stopped compensation and the man was examined by me in October, 1913. The accident happened on Nov. 1, 1912. The employee fell from a staging onto a concrete floor, alighting on his left heel. He had no treatment except massage. The date when compensation was stopped was June 23, 1913.

Examination by x-ray showed a fracture of the os calcis, which was accompanied by formation or development of bony spurs, with a resultant disablement for the performance of the ordinary work of carpenter. Later the employee was operated upon twice at the Massachusetts General Hospital, and on Jan. 1, 1915, was still unable to go to work.

CASE X. This case was referred for examination by an arbitration committee. At the hearing both the insurance company's doctor and the attending physician agreed that the man was malingering, but on examination the facts showed that the employee had a definite myositis of the deltoid muscle accompanied by painful spasm.

This was a case in which the man had been treated for a long period without examination, and because the man looked well it was assumed that he could work. By reason of the examination made after the hearing treatment directed to the injured muscle was begun, and as a result of this treatment the employee was able to return to work six weeks later.

CASE OF J. H. This man was examined by me on Dec. 9, 1913. He gave a history of having been overcome by smoke fumes, and of being taken to the Boston City Hospital for treatment. He stated that there was something wrong with his stomach and

his head as a result of the poisoning, and that he was unable to stand on account of dizziness. He also said that while coming from the hospital he had fallen down.

Examination in this case showed an advanced case of tabes. On Oct. 7, 1914, this man again appeared with a report based on an impartial examination. Since his first examination he had been employed by another employer who was insured with another insurance company. At this time he gave the history that in April, 1914, he stubbed his great toe, fell, and as a result injured his right leg and the right side of his head. He gave the history of pain in his leg and weakness. He denied any previous claim under the Workmen's Compensation Act, and gave the history of having been operated upon by the doctor representing the insurance company for the removal of varicose veins. He still complained, however, of weakness in his legs. The impartial doctor appointed by the Board as a result of his examination had ordered a bandage for the varicose condition; also this man was examined by an impartial doctor before the Board. All told, he had been examined four times and operated on once without the diagnosis of tabes having been made.

CASE OF F. F. This man was injured on July 27, 1914, as a result of which he received a fracture of both bones of the right forearm with compounding of the right ulna. The case was treated throughout by a doctor representing the insurance company without any x-ray diagnosis of conditions and without the formation of any callus. Compensation had been stopped prior to my examination of Oct. 24, 1914, on the ground that while under the influence of liquor he had fallen downstairs, re-breaking his arm.

Examination by the x-ray showed an ununited fracture of the right ulna and a united fracture of the right radius. Based on the x-ray plate it would seem that the direction of the fracture in the ulna and the direction of the fracture in the radius were on different planes, and if it is possible in a case of this kind that the treatment that would keep one bone in place would tend to throw the other bone out. Now since in this case the radius had united and the ulna was still thrown out it was hard to understand how the second injury could re-break one bone and not rebreak the other. A discussion was held with the insurance company's representative and their doctor. Consideration of the facts and the x-ray plates at this discussion led to the resumption of compensation payments and to an agreement to pay for an operation which should restore the arm functionally.

CASE OF B. M. The accident in this case occurred on July 9, 1914. The injured employee, a man fifty-six years of age, slipped from the step of a wagon to the ground, and was thrown so that he landed in a doubled-up position. He had suffered pain around his body, and was unable to turn over for two weeks. The doctor representing the insurance company reported him fit for work in October. The employee went back to work for three days shovelling coal; he then strained his back again so severely that he was unable to turn while in bed. As a result of the re-injury he had pain around his body and down his left leg. This employee was examined by me on Nov. 24, 1914.

The examination showed that the man had a flat, rigid lumbar spine, without evidence of injury to the sacroiliac joints. He had marked spasm of muscles on either side of the lumbar region. The x-ray plate showed a compression and a crushing of

the second lumbar vertebra, and this would satisfactorily account for all pain and difficulty that he had. In this case, also, there was probably the added disability which came from injuring an old back which was probably becoming deficient by reason of gradual static difficulty as a result of his years of work.

CASE OF E. J. C. Age, twenty-seven. Married, with three children. Accident, July 11, 1914. This man fell about six or seven feet striking his right side on a girder. He was treated at the Boston City Relief Station, and their examination showed a breaking of the tenth and eleventh ribs, multiple abrasions of the right arm and rupture of the right kidney. He was in the relief hospital three days, and in the City Hospital three days. The injury in this case was aggravated by the fact that the man was told of the rupture of his kidney. The urine in the case cleared up in a few days, and there had been no symptoms referable to the kidneys, but the man was suffering from a marked fear that the kidney would rupture again if he started to work. To remove this idea from his mind an examination was made which showed myositis of the right lumbar muscles, which was accompanied, on motion, by muscle spasm and localized pain. This is the type of case which needs judicious encouragement. This man needed work to loosen up the back muscles, and he also needed work to prove to him that there would be no resulting danger to the kidney. In other words, the best therapeutic agent in this case for his moral and physical condition was employment.

CASE OF A. B. This man, an Italian baker, received an injury by reason of having his hand caught in a machine. As a result of this accident he injured the metacarpal bone of the right hand, with an inflammation of the tendon sheaths over it.

When the period of acute inflammation was over, and it was necessary to start using the hand in order to insure its future usefulness, this man's employer, a woman engaged in the baking business, appeared at the office of the Board with the employee, and she was told the kind of work that would be useful to the man in making a recovery. The woman took it upon herself to see that such work was given, and the man at once passed from a totally incapacitated class to the class, where, in addition to what he could earn, partial compensation also was paid.

One point which stands out forcibly as a result of experience in making examinations is the fact that oftentimes a long period of disability may be prevented if a little direct personal interest is taken in the cases of incapacitated employees by employers or surgeons. By way of digression it might be well to state here that the writer has found very little conscious fraud attempted by injured employees. There is not the incentive for a wage earner to remain from employment in the hope of getting large sums of money that existed in times past. Again, the temptation to prolong litigation extending over a long period, as is seen in ordinary tort cases, does not appear to any great extent under the act because of the fact that those who can afford to lay off are not those engaged in the industries insured. Reverting to the subject of returning employees to industry, and follow-

ing out the suggestion of establishing a more personal relationship, it appears that there is needed definite follow-up treatment in accident cases after they leave hospitals. It is all right to give advice to an injured man, but for his good and for the good of the community it would be much better if the proper treatment were given. To my mind one of the most important forms of treatment is massage, when given under proper conditions.

While acting in the capacity of impartial physician it was most interesting, if somewhat arduous, to make as complete a study of each case as time and the conditions under which the examination was made permitted.

In conclusion, the fact should be mentioned that the manner in which the Industrial Accident Board has applied the opinions given to the final determination of the cases referred for examination has been most gratifying.

AN OUTLINE FOR THE MANAGEMENT OF CARDIAC CASES FROM THE OUTPATIENT DEPARTMENT STANDPOINT.

BY MARK H. WENTWORTH, M.D., CONCORD, MASS.

In taking up a case of cardiac disease the first questions of interest are the present health of the members of the family, the deaths with their causes, and whether there has been any rheumatic fever or cardiac disease in any of the direct branches of the family.

The greater part of the lives of our patients is spent in their homes, and therefore it is of the greatest importance that we know the home conditions, the location, possibilities of getting good air, freedom from noise, the number of occupants per room, the plumbing, the possibilities of rest and the chance for recreation—whether the child can have a quiet place in which to play, or if it must go into the street for diversion. Perhaps the most important question of all is that of discipline, and are the family able and willing to cooperate.

Without proper opportunities for rest, recreation, and discipline, we can scarcely look for a speedy or permanent improvement.

In obtaining the *past history* of a child, we should learn about its general health, the infections which the child has had, with special reference to their sequence and their relation in time to the rheumatic infection.

The infectious diseases which may have a causal relation are measles, diphtheria, pertussis, scarlet fever and smallpox, but chorea, tuberculosis and influenza, colds and coughs, and adenoids must be considered, and more especially pharyngitis and tonsillitis.

In taking up chorea I must digress a moment,

as its causes and sequelae are yet under discussion. Osler states that "it has a remarkable liability to acute endocarditis." A causal relation between chorea and rheumatism has been claimed by many. Endocarditis has been claimed by some writers to be the cause of chorea. Kirkes and others state that endocarditis is by far the most frequent lesion in chorea, but their exact relationship is as yet undetermined. The endocarditis of chorea is invariably of the simple form and in itself is not dangerous, but it is apt to lead to the sclerotic changes in the valve which produce incompetency.

The digestive capacity, diet and regularity of the bowels all have their weight in the outcome to be expected.

Under the heading *Predisposing Factors*, we must take a broad view of the general health and of the previous condition of the child; the family history has its bearing or may be presumed to have from the number of cases which give definite evidence of rheumatic or cardiac affection in their history. The social history has an important place also. Dampness, unhygienic surroundings, close contact with others of the family who may have throat or tonsillar affections all having their direct or indirect influence. By far the most important, however, is the past history, often showing a trail of diseases undermining the health of the child, and finally an attack of rheumatism—probably the most important predisposing factor of all.

In making the physical examination it is necessary not only to make a complete examination, but the general condition, as affected by the cardiac involvement, is studied with a careful view to laying out the proper care for each individual case in the home. Locally a study is made of the enlargement of the heart, regularity and force of the beat, location and quality of the heart sounds and murmurs, the quality of the pulse and estimate of the cardiac capacity. The accuracy of this latter point would be greatly increased by the use of a sphygmomanometer.

Drugs. The most important drug in the treatment of cardiac affections is digitalis. Fraenkel, Schwartz and Cloetta have shown that, in therapeutic doses, digitalis has no effect upon the normal heart either in affecting the strength of the beat or in causing hypertrophy; neither has it any effect upon perfectly compensated undilated hearts with a valvular lesion. Its chief effects are seen in dilated hearts whose myocardium still retains some reserve power. In the severest forms of cardiosclerosis and fatty degeneration it may stimulate the fibres to the limit of their powers and thus do actual harm. In giving digitalis it is important to get a definite effect and yet not push the drug beyond the first stage of its activity, *i.e.* slowing of the pulse and increasing its size and to avoid the onset of the second stage, *i.e.* arrhythmia.

As hearts vary in their susceptibility to digitalis, and since it begins to act only after 24 hours and may have a cumulative effect, the

amount and frequency of the dose is not a simple problem. Its effect must always be carefully watched and if the rhythm becomes more irregular, it must be discontinued. When any disturbance of the conductivity occurs it is positively contraindicated. It is useful, first, in cases with broken compensation; second, in cases where acute dilatation persists in spite of rest; third, in persistent tachycardia which does not yield to other treatment. It is contraindicated in cases of heart block and in cases where the heart muscle has been diminished by myocardial changes.

Strychnia. There are some cases which show some signs of circulatory weakening and yet which do not seem to require digitalis. In these cases strychnia and camphor are used with good results. Strychnia is particularly valuable in cases of disturbed respiration following extreme heart failure, as in Cheyne-Stokes breathing and cardiac asthma. In such cases it should be used whether digitalis is being used or not. Camphor, like strychnia, is a vasomotor stimulant. Its most important use is in shock. (Best used as camphorated oil in 20 to 45 minim doses.)

Caffeine, like digitalis, acts upon the cardiac muscle, and raises the blood pressure by constriction of the peripheral blood vessels, and is, therefore, particularly valuable in conditions of shock and collapse. In this regard it is more valuable than camphor or strychnia, but unfortunately its use is often accompanied by palpitation, sleeplessness and even nausea, vomiting and delirium, which occur particularly easily in cases of heart disease.

Aconite in therapeutic doses slows the heart by stimulation of the vagus, but has little effect on the heart muscle. It is, therefore of value in fevers where the heart muscle itself needs no stimulation, but the heart needs slowing. It is of value in many cases of tachycardia, especially those of nervous origin.

The nitrites are ideal in many cases to relieve the work of the heart over short periods where the blood pressure is not already too low to admit of their use. Nitroglycerine must be used with the utmost caution, as individual susceptibilities vary greatly. Loeb reports a case of collapse after a dose of a hundredth of a grain, whereas Stewart has reported giving 20 grains a day to a single patient.

The home regulation of a case is the most difficult to manage, but much may be done if the home facilities are not impossible and the family are willing to coöperate. A room can usually be obtained where the child may be left in comparative quiet and lie down for periods of rest both morning and afternoon, the length of time depending upon the cardiac condition and the degree of patience which the child has for keeping quiet under these circumstances. In cases of broken compensation the only place for them is bed, and bed 24 hours out of the 24. When compensation has been established it is wiser to give the patient a few simple resisted movements

a few minutes a day or several times a day for a few days than to run the risk of their getting up, for I have found that if you once let them get up it is hard to keep them from overdoing it at first and a great hardship to have to go to bed again. Each case must be regulated to its own ability to do work, *i.e.* to be about. The first work to be taken up beyond the resistance exercises is walking. This must be very short at first until the power of the individual is learned; then the amount is gradually increased. The trouble with treating these cases which have to go to bed is that we cannot see them personally and so are unable to judge of their actual condition. Some others are so severe that they require hospital treatment, and are referred directly to them. Some others of less severity, but requiring indefinite bed care I have been able to visit myself or have seen through the kindness of the Social Service Department. These were cases which I did not care to have directed to go to bed for a week and come in to report at the Dispensary in ten days or so.

The Diet in the severer cases, where bed treatment is required is all-important. An increase in blood pressure becomes manifest within a few minutes after the ingestion of a meal, reaches its maximum within one or two hours and declines more slowly. The pulse rate is always distinctly increased by eating. Therefore the diet should be light, just enough to keep up nourishment, without ever causing a sense of fullness or of allowing gas to form. Gas in the stomach pushes up the diaphragm and embarrasses the action of the heart, causing decreased systolic output and an increased rate. The lacto-cereal diet is the best. This is made up of milk, eggs, custards, junket, crackers, zweiback, and toast. Most of the prepared cereal foods are good, since they give much nourishment with small bulk and are easily digested. Meat should be given sparingly, if at all, because the purin bodies tend to raise the blood pressure and the fibres are relatively slow of digestion.

In cases of edema liquids should be limited to three pints a day. Salt should be withheld as much as possible, as it is a contributing factor in the production of edema.

An excellent diet for heart cases of a severe form (Widal and Pavel, Strauss and Richter) which can be modified to suit the individual case, is as follows:

8 A.M. cereal, soft egg, toast, coffee, 6 oz.
10 A.M. milk, 6 oz.; soft egg, crackers.
Noon soup, chicken, potatoes.
4 P.M. milk, 6 oz.
6 P.M. milk, 6 oz.; soft egg, crackers, prunes.
9 P.M. milk, 6 oz.; bread.

In the less severe cases it is well to have the patient lie down for at least 15 minutes after each meal and for a full hour morning and evening. In order to be sure that this is carried out a definite hour should be selected, say from 11 to 12 and from 2 to 3, and have the one responsible for the child bring a list of the food, with

the amount eaten, as well as the actual hours in bed.

As to recreation, the child, if possible, should be kept off the street, even in the milder forms. Comparatively quiet yards or porches out of doors are often obtainable, and there the child may be amused with blocks or cards or toys; the older children playing house or some other non-exciting game.

In order to keep track of the more severe cases it is necessary that they be visited by the district physician, when available, or through the office of the Social Service Department. The physician-in-charge cannot be expected to see more than a small proportion of the cases given over to home treatment. At these visits the following points should be noted:

General condition.

How it stands in relation to condition at the last visit.

Cardiac condition.

How vigorously the treatment has been carried out.

How much the child has responded to it and whether it is more or less than was expected.

Whether it is wise to continue treatment or, if not, what changes should be made.

Prognosis. What is to be expected of each case should be pretty fully discussed at the first visit, modifying this prognosis perhaps in minor details at the second visit. It is in this way only that we can expect to get clear insights into the cases and to estimate properly the probabilities of success from the treatment.

NOTES OF A CONFERENCE ON THE MEDICAL AND SOCIAL ASPECTS OF SYPHILIS OF THE NERVOUS SYSTEM.

HELD AT THE PSYCHOPATHIC HOSPITAL,
MAY 27, 1915.

(Series concluded from page 53.)

THE DEVELOPMENT OF THE GOLD SOL "PARETIC" REACTION AS COMPARED WITH THE "CEREBROSPINAL SYPHILITIC" TYPE, CONSIDERED FROM THE TIME NECESSARY TO FORM A COMPLETED REACTION.

By H. C. SOLOMON, M.D., AND E. S. WELLES, BOSTON.

What the significance of our findings may finally prove, we cannot say. The comparison of left and right shows differences looking in the same direction in the complication of pattern of frontal and temporal regions, and differences looking in the opposite direction in the superior parietal region.

COMPLICATION	L < R in general;	L = R in paresis
frontal	L < R	L < R
superior parietal	L > R	L < R
inferior parietal	L = R	L > R
temporal	L > R	L > R
occipital	L < R	L = R

In point of fact, the differences are slight in some instances so that the table may be arbitrarily simplified as follows:

	L < R in general;	L = R in paresis
frontal	L < R	L < R
superior parietal	L > R	L < R
inferior parietal	L = R	L > R
temporal	L > R	L > R
occipital	L = R	L = R

Accordingly the paretic right frontal pattern is simpler than the general right frontal pattern, judging by its left-sided fellow; but its variation is in the same direction and may, perhaps, safely be neglected. The temporal differences, looking in the same direction, and the virtual equivalence of the occipital patterns, leave us with parietal differences alone. The superior parietal observations indicate more differences than the inferior.

If the pattern of the left superior parietal region, viewed through a window of given size, is to be represented by an index 14.3 for cases in general, we find that the right superior parietal window yields for the paretic the index 15.3. Both right and left superior parietal regions in the paretic seem to be absolutely more complex than the same regions in the average brain.

In some such direction must we look for internal characters of the body at the basis of human tendencies if we are ever to be aided by anatomy. It is perhaps too easy to speculate that, on the basis of these brain findings, the paretic is more impressive, less controllable, than the average man. Yet the speculation is not inconsistent with a number of facts and collides with none perhaps.

COMPARATIVE COUNTS OF SULCI IN TEN CORTEX REGIONS OF PARETIC BRAINS AND BRAINS IN GENERAL.

	Male Average	Female Average	Paretic Average	Male Paretic Average	Female Paretic Average
Left frontal	14.6	14.3	15.2	14.7	14.8
Right frontal	15.0	14.6	15.1	14.8	14.8
Lt. superior parietal	14.3	14.7	14.8	14.7	14.6
Rt. superior parietal	14.0	14.1	13.7	15.3	14.1
Lt. inferior parietal	14.1	13.7	13.8	14.0	14.1
Rt. inferior parietal	14.1	13.7	14.3	13.7	13.7
Left temporal	11.6	12.4	12.3	11.4	11.6
Right temporal	11.3	12.2	12.0	10.9	11.1
Left occipital	18.4	17.1	17.5	18.2	18.3
Right occipital	18.5	17.5	18.0	18.2	18.3

PSYCHOLOGICAL WORK.

V. V. Anderson in 1913³ considered a group of 184 specially tested Psychopathic Hospital cases, pointing out in a general way the greater disadvantage entailed by poor auditory imagery, as compared with poor visual imagery. It seemed that there were more syphilitics amongst the poor "audiles" than amongst the poor visualizers.

A more extensive piece of work than that by Anderson has since been done at the Psychopathic Hospital by Mr. Bazeley and Miss H. M. Anderson. Bazeley and Anderson find speech defects to be a rather common property of our congenital syphilitic cases and difficulties with vision to be slightly more common than defects of hearing. Disorders in the receptor apparatus (including apperception, elementary, associative power, range of observation and discrimination) are rather more frequent in the congenital syphilitics than in other disorders, although disorders in the field of emotions and the will stand very close to the receptor disorders. When Bazeley and Anderson came to compare the syphilitic cases with non-syphilitic cases on the other hand, they found that disorders on the side of the emotions and will to run far in the lead of other psychic symptoms. Of course there is something of an artefact about this comparison, since about half of the non-syphilitic patients brought to the Psychopathic Hospital for examination are brought on the score of some delinquency or social inadequacy, and the tale of disorders in the field of emotions and will is naturally swollen, from the fact that the scope of the Psychopathic Hospital work has so much to do with delinquency and potential delinquency. The effect which syphilis has upon the nervous system appears to be a very general one. It is important from every standpoint to consider that, as Bazeley and Anderson seem to demonstrate, trouble with the senses and with the elementary working up of sensations is so much more frequent a phenomenon than it is in non-syphilitic cases. No decision has yet been rendered as to the point of Dr. V. V. Anderson concerning the greater proportion of syphilitics among the poor "audiles" than amongst the poor visualizers.

Work on the Chemical and Cytological Side (H. C. Solomon, H. O. Koefod, E. S. Welles): The Psychopathic Hospital laboratory has continued work intensively on the gold sol reaction and has studied the cytological situation in the cerebrospinal fluid with an endeavor to correlate the gold sol and cell results. The work of the laboratory has been backed effectively by the pathological service of the State Board of Insanity. The extensive service (over 150 autopsies in the year) of the pathological department of the State Board of Insanity has permitted the working out of clinical laboratory ideas in a very brief compass of time.

The evolution of the work of Solomon and his associates has been an interesting one. Proceed-

ing from a routine application of the Lange gold sol test,¹² whose value had come to be recognized in several of the laboratories in this country, Solomon proceeded to attack the problem in the cerebrospinal fluids of autopsied cases.¹⁷ It had been an unfortunate fact that in the nature of things the Wassermann reaction had proved entirely inapplicable to the fluids of autopsied cases. For this reason, confirmation by the pathological anatomist of the conclusions of the clinician had been in many instances delayed. It was the good fortune of the laboratory to discover that the Lange method was entirely applicable to fluid post mortem. Moreover, the surprising result was obtained that the reaction was found to differ in different parts of the cerebrospinal fluid system.¹⁸ Thus a chemical proof was obtained of differences in the qualities of different parts of the cerebrospinal fluid system, so that one could separate, on the grounds of colloidal chemistry, the fluid from the spinal part of the cerebrospinal fluid system from that of the cerebral ventricles and from that of the subpial fluid. Naturally also the subdural fluid was found to exhibit at times a different gold sol reaction from the other fluids just mentioned; but this latter fact might have been expected from the general anatomical belief that the subdural space is a closed space not in communication with the subpial space. No definitive proof appears ever to have been brought concerning the questions of communications between the ventricular fluid, the subpial fluid and the spinal fluid. Much has been said upon both sides, and Dr. Solomon has given a brief analysis of the two sides to this important question in a former paper.¹⁸

It must be remembered that the proof from colloidal chemistry as given by Lange's gold sol test is not entirely convincing, since this test is a test for *pathological* fluids. Accordingly we have not yet proved that the fluids in different loci of the cerebrospinal system have normally any important chemical differences. All we can at present say is that in pathological conditions, these loci are rather apt to show significant differences in the gold sol reaction. There appear to be coming in slowly a number of observations from the surgeon's table which indicate that the ventricular fluid and the subpial fluid may show differences in the Wassermann reaction. Taking these two points together, namely, the differences in the Wassermann reaction as demonstrated in life, and the gold sol reaction as demonstrated in autopsied cases, we must feel entitled to conclude that at any rate under pathological conditions, and possibly under normal conditions, there are important chemical differences in these loci. Again it was thought that these pathological differences in the different loci of the fluid might well have significance from the practical standpoint of treatment. It seems natural to conclude that varieties in the Wassermann reaction and in the gold sol reaction in different loci

of the nervous system should indicate differences in the spirochete content of these cases. If not differences in the spirochete content, then differences in the effects of spirochetes in the different loci may be suspected. Since the papers of the conference, of which this article is intended to be a summary, the gold sol work has demonstrated still more prettily the point just mentioned. A case autopsied by Dr. M. M. Canvan, Assistant Pathologist to the State Board of Insanity, has shown one sort of gold sol reaction on one side of the brain and another sort of reaction on the other side in a case of unilateral lesion (cyst of softening). This case will be reported on more especially in another connection.

Although this work has perhaps no important practical application at the present time, the Psychopathic Hospital workers were encouraged in the belief that a certain optimism is not only necessary, but logical, in the therapeutic situation which confronts us at the present time in the field of neurosyphilis. For it is clear that treatment which might serve to clear the *spinal locus* of the cerebrospinal fluid system might fail to clear the *ventricular locus* and that the *subpial locus* would perhaps be still more difficult to sweep clear of all morbid agencies and materials.

It was consequently with renewed vigor that the intensive treatment of cases of syphilis of the nervous system has been prosecuted and will be prosecuted in future. Another important fact seems to be that according to the conclusions of Solomon and his associates, it is practically, if not theoretically, impossible to distinguish by any available clinical or laboratory tests between so-called cerebrospinal syphilis and general paresis. Now in general we have long been taught to consider that cerebrospinal syphilis is somewhat amenable to treatment, and we are bound to express a certain optimism as to continued and intensive treatment of these "plain" cases of neurosyphilis. It is well known that most workers maintain that the situation is quite otherwise in general paresis, which is commonly regarded as practically inaccessible to treatment. But, if now we must put general paresis into quotation marks, and regard it as parenchymatous neurosyphilis and state that to the parenchymatous element there must be superadded in most cases a meningitic element, then what becomes of the distinction which leads us to say that "plain" neurosyphilis is amenable to treatment, but parietic neurosyphilis is not thus accessible? The logical outcome of this situation is, according to Solomon, that every case must be subjected to therapeutic test if we are to determine whether there are two groups of neurosyphilis cases, namely, *Group A, which does respond to treatment; and Group B, which does not respond to treatment.* If it seems worth while to regard cases which do not respond to treatment as cases of "paresis," then those who desire to use this term are welcome to its use.

Add to these considerations the fact that there certainly exists a condition which we have called *latent neurosyphilis*, in which all the available laboratory signs are positive, and in which no mental symptoms have as yet occurred, and it will be seen that conditions are still more optimistic as regards treatment. If, in short, before mental symptoms appear in cerebrospinal syphilis, there may exist for months or years a full-blown chronic meningitis, with a full complement of albumin, and excess of globulin, combined with a positive Wassermann reaction in both serum and spinal fluid, and positive gold sol reaction in the spinal fluid, then we must certainly regard such cases as very important ones to treat. To be sure, that which strikes very deeply into the parenchyma must be entitled, in the present phase of science, to be regarded as incurable. How far the symptoms of general paresis and neurosyphilis in general may be regarded as "functional" and as irritative rather than paralytic (to use Hughlings Jackson's distinction) must remain a question. We are under the impression that some of the most socially difficult cases are the most amenable to treatment, whereas some of the most grandiose and morbidly happy cases are precisely those in which the treatment is less effective. Perhaps the point lodges in this, that in these latter "quietistic" cases, the lesion has struck deeply into the parenchyma, whereas in the "anti-environmental" group of cases the symptoms are largely irritative and indicate much less destruction of tissue. The probabilities are that in practical hospital treatment of paresis, the most difficult cases, from the standpoint of the *ménage*, have not been the cases elected for treatment, but that much time has been expended upon the incoherent and demented group on the one hand, and the happy and grandiose on the other.

Enough has been said to indicate the grounds for optimism in the present situation.

SUMMARY.

The writer has endeavored in these notes to present the neurosyphilis situation as it faces us locally and has not endeavored to sum up the neurosyphilis situation in general. Still it is clear that amongst the ten papers of the present series will be found briefly mentioned most of the aspects of the neurosyphilis problem which are appealing to the world at the present time. The humanity of Dr. Post's remarks in Article I needs no comment. Especially wise is his note that "*when a social worker comes into the family of the syphilitic, she must dismiss from her mind any pre-supposed guilt.*" It is also important to take seriously Dr. Post's point that when all the laboratory signs of syphilis of the nervous system are present and no clinical features of neurosyphilis are outstanding, there must be a serious question whether the clinical work is being done effectively. We need very intensive

clinical work in the field of neurosyphilis at the present time. We cannot get on with the kind of loose work which prevails, it is to be feared, in certain fields of private practice and in certain institutions.

This eagerness with which social workers are beginning to take up the problem of the examination and prophylaxis for syphilitic patients and their families, and the entirely scientific manner of the approach of these social workers to their problem, are to be seen clearly in the communication of Miss Wright (Article II) and of Miss Jarrett (Article III), as well as in the spirit of Dr. Gregg's article (IV) on "Some Economic Facts of the Problem." How concrete the social worker's confrontation of the problem is can be seen from the appendices to Miss Wright's article (Article II), embodying the blank forms which are used in the syphilis family investigation. The syphilis of railroad men and even of a lighthouse man, of caterers, cooks and nursemaids, mentioned by Dr. Gregg, is a mention of nothing new to the community; yet we cannot be too insistent upon the familiarity of such information. These facts should stand out prominently in our propaganda.

Article V by Bazeley and H. M. Anderson, upon the mental features of the congenital cases, is a mere beginning of work in this direction. How much of our truancy and juvenile court problem is due to congenital syphilis cannot yet be safely estimated, but whatever the true percentage of the luetic fraction among these anti-social cases, the absolute numbers are sizable enough to warrant attention. The impairment of the sense organs and the elementary psychic apparatus, brought out in this article as characteristic of congenital syphilis, is of some general importance.

There follow articles (VI, VII, VIII and IX) upon the diagnostic situation in neurosyphilis. Article VI by Solomon and his associates is a continuation of his previous work, and not only emphasizes the fact that the gold sol examination is essential in cerebrospinal fluid examinations, but also that it is at present impossible to tell the paretic from the non-paretic form of neurosyphilis. Upon this fact is based the important conclusion above mentioned in the ninth section of these notes.

Article VII shows that the cell count in the cerebrospinal fluid is not an index to the quality or degree of irritative and paralytic changes shown in the symptoms of cases of neurosyphilis.

Article VIII brings up a rather large question,—whether the laboratory signs of neurosyphilis, and in particular, signs of extensive chronic inflammation of the nerve system, appear before the occurrence of any characteristic mental symptoms. We have been fortunate to discover a certain number of these cases which, of course, will often elude observation because, having no mental symptoms or other symptoms of importance, such cases would not naturally be

subject to intensive examination. An extension of family work in syphilis, and especially neurosyphilis, may uncover a great many more of these cases that we have termed "latent" neurosyphilis, or somewhat fantastically, *General Paresis sine Paresis*. Do these findings indicate certain unsuspected conditions in the genesis of neurosyphilis? It is too early to make such a claim. It is certain that after all, such cases deserve immediate and intensive treatment.

Article IX makes a special point concerning the gold sol reaction, namely, the point that the cerebrospinal syphilitic gold sol reaction is in some sense a *forme fruste* of the characteristic paretic reaction. Should this point be maintained, the essential unity of the two conditions would be still further established. The true explanation of the *forme fruste* here described must probably await developments in colloidal chemistry.

Article X, of which the present paragraph forms a part, endeavors to give a brief account of the special aspects of the neurosyphilis situation which have attracted attention at the Psychopathic Hospital.

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(Conclusion of Series.)

Clinical Department.

A NON-FATAL FRACTURE OF THE AXIS.

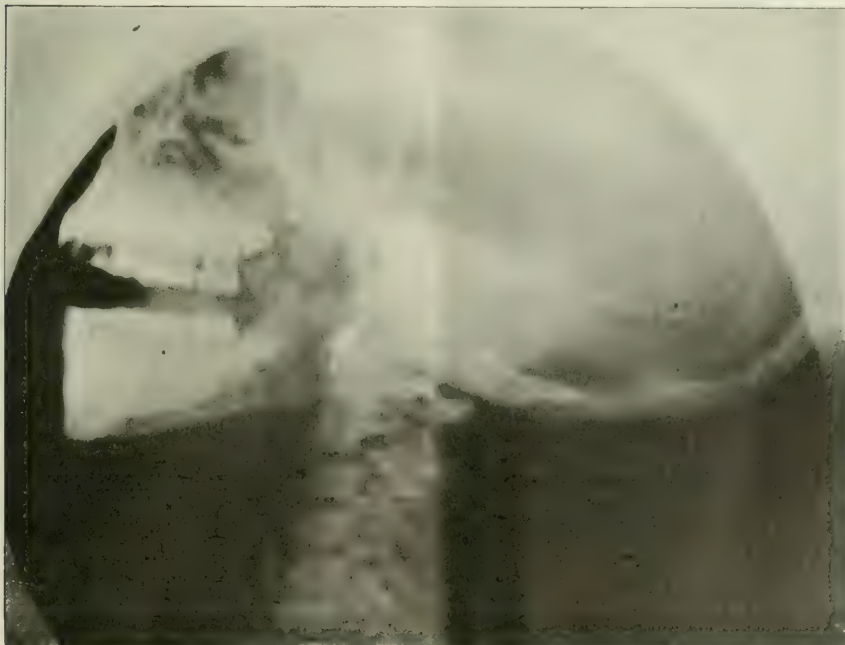
By FREDERICK W. O'BRIEN, M.D., BOSTON.

Fracture of the axis in itself is not often recognized in the living; so that a non-fatal case

of unquestioned fracture of the second cervical vertebra is, I believe, worthy of report. Mixter and Osgood in their review of the literature on "Traumatic Lesions of the Atlas and Axis" (*q.v. Amer. Jour. Orthopedics*, February, 1910.) call attention to the unusual amount of room allowed the spinal cord in this region, which may very well account for the lack of cord symptoms in the case at hand. The mortality, however, in injuries to the axis seems to bear a direct relation to the involvement or lack of involvement of the odontoid process. It is noteworthy that in six of the eight fatal cases recorded by Corner (*Annals of Surgery*, 1907), the odontoid process was broken, while in ten non-fatal cases fracture of the odontoid occurred but once.

The patient, a male child, aged seven years, was admitted to the Brockton Hospital August 26, 1915, giving a history of having fallen from a tree five days before and striking the ground on his back. He complained of inability to move his head without pain, and indeed it was notable how he had already adapted himself to his new condition for he supported his lower jaw along the ramus with his upturned hand. In this way he was able to turn his head about with some comfort and much less limitation of motion.

There was absolutely nothing remarkable about the child except his carriage. The pupils were equal and reacted normally to light and distance. No reflexes were disturbed. There was no paralysis of any muscle or group of muscles. Sensation was un-



impaired. Pressure over the second and third cervical vertebrae was painful.

Roentgen examination disclosed a complete fracture of the laminae of the axis (see Fig.). An orthopedic support was applied by Dr. G. A. Moore. This was cut down after five weeks, at which time the writer made a second roentgen examination which revealed a union so excellent that one would feel inclined to doubt that there had ever been any solution of continuity. The child now is about playing quite as though nothing had happened.

New Instruments.

THE VACUUM FLUSHING LEECH.

By HERBERT SPENCER WHITE, M.D., ORWELL, ONTARIO.

THE name of this instrument is suggestive of its construction and one can readily appreciate its value, when once demonstrated, in aiding, in the treatment of special localities, and of the ultimate elimination of the infecting organism and repair of the parts.

This apparatus demonstrates the application of a very simple law of nature and how it can be used with success in the treatment of diseased tissues of the human body, where the process of extraction or drainage of toxic sera, and of inflammatory exudates and of germs themselves, is desired; where other objects in the treatment are to increase the vitality of the part; to soothe the part; and to use our most powerful germ destroying agents in as concentrated a form as possible, without injuring in any way but in aiding the effort nature is putting forward to clean up the diseased tissues.

For this purpose I have devised for the treatment of special localities, special leeches, or vacuum cleaners.

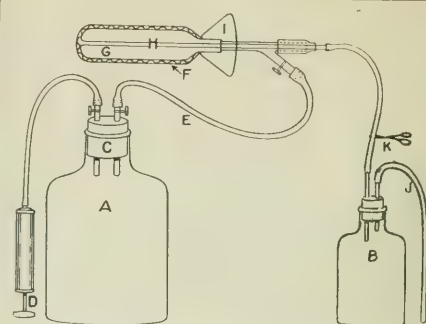
1. A vaginal leech for the treatment of vaginitis and to aid in the depletion of pelvic inflammatory conditions.

2. An intra-uterine leech for the treatment of the endometrium, the metrium and the uterine appendages.

3. A male urethral leech, to treat urethritis, either acute or chronic.

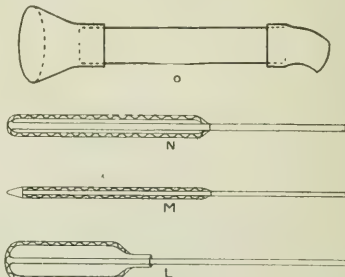
Our most powerful germ destroying agents are in the form of liquids, vapors and gases. Liquids are used generally as simple antiseptic cleansing solutions; some are very powerful corrosives and must be used with great care. Vapors and gases are used principally by boards of health and hospitals to disinfect the sick room. The objects of disinfecting are to destroy the germs of disease and to make the dust on the floors and walls as sterile as possible. To accomplish this an oxidizing or corrosive agent must be used, and to be effective, must be employed in the presence of moisture.

My vacuum flushing leech is devised to ac-



DRAWING REPRESENTING THE VAGINAL LEECH FULLY CONNECTED.

- A. Vacuum chamber.
- B. Vessel to hold any vapor, gas or solution.
- C. Perforated rubber cork.
- E. Tube connecting vacuum chamber with leech (H, I, F, G) and B.
- J. Tube to carry off excess of gas and vapors when they are used.
- K. Clamp to pulsate the leech and, when open, permits the contents of B to pass to the leech.
- D. Exhaust pump.



- O and N represent the intra-uterine leech.
- O. A very light tube large enough to admit N freely; the funnel at the end is of rubber, and fits over the cervix.
- N. The intra-uterine tip is made of flexible material, and porous to the extent of ten thousand openings to the square inch.
- M. Male urethral leech.
- L. Vaginal leech.

complish the above services for certain localities of the human body and it accomplishes this feat more or less completely. Any liquid vapor or gas may be made to come in contact with the surface under treatment. Vapors and gases have, heretofore, never been employed to fumigate or disinfect the cavities of the human body. With the aid of my leeches they can be used with perfect safety and yet with a thoroughness that is seldom accomplished at any outside fumigation; while at the same time the process of extraction and drainage is being carried on.

This is all accomplished in an air tight vacuum chamber and thus is not only free from the dangers of outside contamination but is absolutely aseptic and antiseptic, as is easily seen from the diagram of my vaginal leech.

When the leech is applied and as soon as sufficient exhaustion is reached,—any degree of exhaustion may be obtained up to fifteen pounds to the square inch, the atmospheric pressure,—ten thousand suckers to every square inch of surface are set to work. Now, since the average

sized leech covers about twelve square inches, there are 120,000 suckers at work all discharging into the vacuum space between the cylinder and the outside covering.

The inflammatory exudates and toxic sera, which are held in the tissues only because the atmospheric pressure is the same upon all sides of them, both inside the tissues and outside, will, as soon as the outside pressure is taken away, move in the direction of the least resistance, namely, toward the leech.

The instant any product of extraction reaches the surface of the leech it becomes powerless, and is at the mercy of our antiseptic and oxidizing agents and can be flushed away. Thus the leech may be maintained indefinitely in contact with the tissues and always in a state of antiseptis. It can be fumigated frequently without any inconvenience or suffering whatever, on the part of the patient.

If equilibrium is maintained in the tissues the infecting organisms will remain there and work and continue active until they are gradually forced out or destroyed by the vital forces of the body. Drained by nature, we say, and in reality the physiological forces of the body, fought away the infecting organism with the outside forces of nature as a handicap.

If they gradually work deeper and deeper into the tissues they meet a strong defensive barrier in the form of a pyogenic membrane and engage in conflict with the resisting forces of the body, with the result that an abscess is formed. The germ process may be vanquished and immunity established. My leeches are designed to avert or lessen the danger of the foregoing calamity.

So long as equilibrium is maintained, just so long will the forces of the body be taxed to their fullest capacity to ward off the attacking germs.

By the action of the vacuum leech the equilibrium is disturbed, the pressure outside the tissues is lessened, and the toxic substances are gradually forced from the invaded territory into the leech and, once there, are quickly dealt with by our antiseptic agents and flushed away to a sealed retainer. Now the tissues may be bathed with any soothing lotion. Reinforcements are constantly reaching the site of conflict through the hyperemia that is induced. Heat is made to contract the tissues *ad libitum* and the process of repair is rapidly carried on.

Unlike Bier's hyperemia, produced by cupping, there is no stasis of the blood stream, but a mild hyperemia is produced under forces fully as powerful as any Bier has suggested.

The treatment is carried on while the patient is in bed in a recumbent position, and, without any inconvenience whatever, no pain or disturbance of sleep. The use of the bed-pan is dispensed with and yet any quantity of bathing solution may be used, up to many gallons.

My intra-uterine leech is provided with a flexible tip which is easily made to conform to any

position; it is also made adjustable to any depth of uterine cavity. Being less than a half inch in diameter it can be used in the majority of infected uteri without any degree of dilatation.

My male urethral leech is a demonstration in contra-distinction to Bier's hyperemia treatment. The mucous lining of the male urethra being extremely sensitive and tender, is very prone to injury unless treated with extreme caution. The application of my leech is absolutely free from pain or discomfort of any kind while in action. The only pain experienced is in its introduction and withdrawal, which is readily overcome by the use of a mild solution of cocaine. Its application must be used at the discretion of the operator.

Some might infer that it is impossible to remove or abstract, mechanically, living germs from their associations with the tissues, while others are just as frank in their statement and belief that nothing within reason is impossible.

If germs can be removed mechanically they must be free in the lymph spaces and be able to travel with the lymph. Where the phagocytic cells of the blood are able to attack a germ there must be a space, however small. It is in this space that the germs, in their active state, are able to produce an effect upon the tissues, and it is from this space that they must be removed and are removed successfully by the activity of the white corpuscles. We have microscopical proof that the leucocytes do engulf and carry germs from the tissues. This act is just as truly mechanical in its science as would be the act of carrying a load from one room to another.

Again, one might say that it is impossible to act upon them by any outside force. The inside tissues, being in communication with the outside through the lymph spaces and scarified external surface, become acted upon the moment the atmospheric pressure outside is removed. The equilibrium inside the tissues by virtue of the expansive or volatile nature of the liquids and gases associated with them is also disturbed. In the endeavor to re-establish equilibrium again these forces must of necessity move towards the outside, the direction of least resistance. The germs which are occupying these lymph spaces must likewise of necessity, be forced to follow the lymph current.

Would it be possible to extract pus from a cavity within the tissues? This would be possible from the above argument, but the pus would, of necessity, have to diffuse through the tissue lymph spaces which would require a long continued disturbance of the equilibrium. It would not be possible if the pus were walled off by a pyogenic membrane unless it were possible to scarify or puncture this membrane,—if punctured from the outside the process of evacuation is made very simple.

Some are not sure but that pus is a beneficial agent in the repair of the tissues and ought not to be removed. It is true this was the accepted theory a few years ago, and surgeons were in

the habit of inoculating their wounds to assure a goodly supply of pus. If there is anyone who still maintains that pus is a good thing for the tissues, for him I have no argument, and will keep as far from him as possible.

My contentions are that the products of germ growth are gas, the same as any other end product in metabolism. This gas is immediately dissolved in the tissue plasma, producing the toxic sera. The inflammatory exudate quickly follows, and we have what is commonly called an infection. An inactive germ in the tissues would produce no symptoms and again if the products of germ metabolism could be removed immediately, there would be no symptoms. This would not interfere in any way with the phagocytic action of the white blood corpuscles and any germ that might be entangled in the connective tissues could easily be taken care of by them. The symptoms of disease, if any at all, would be greatly ameliorated.

Can a disturbance of the equilibrium which is maintained within the tissues be produced through the unbroken skin or mucous membrane? It can, with the result that stasis of the blood stream is produced which may or may not be of any value in the process of eliminating the infection.

Surfaces which are already discharging pus and toxic sera, as in vaginitis and urethritis and in infected uterus, are already in a state of scarification and in communication with the lymph spaces throughout the tissues.

Is it possible for a mechanical device to act similarly to a live leech? A comparison of my simple device with the action and construction of a live leech will amply illustrate that it is possible.

A live leech placed upon the skin immediately perforates the skin to communicate with the lymph spaces from which it extracts the serous fluids and conducts them to its own interior until further suction is impossible, owing to the filling of the leech, when it immediately drops off.

My artificial leech is furnished with ten thousand suckers to the square inch, all communicating with the lymph spaces in the tissues, providing the surfaces be scarified. It sucks from the tissues and when filled will drop off. But unlike a live leech, and a great advantage over the live leech, it may be repeatedly filled, flushed, and sterilized and maintain its hold on the tissues for an indefinite period, at the discretion of the operator.

Would it be justifiable to scarify a surface before applying an artificial leech? The answer to this is in the affirmative, since there is no danger of introducing infection through the leech.

Would microscopic petechiae result from application of an artificial leech? They would on unscarified surfaces if the application were long continued but not on scarified surfaces.

I have endeavored thus far to make my leeches

speak for themselves. Being my own invention, and a system that is absolutely new to the profession, I have refrained as much as possible from making any bravado statements.

If after reading the article one understands thoroughly the principle involved, the simplicity of the apparatus, its neatness,—no manipulation or fussing in its employment,—and then is skeptical as to its merits, I am afraid that any testimonial one might give would be of very little value. However, I have demonstrated the principle with instruments very crude compared with my present leeches, and obtained very gratifying results,—results that guarantee success for its future.

Medical Progress.

RECENT PROGRESS IN OPHTHALMOLOGY.

BY EDMUND W. CLAP, M.D., BOSTON.

THE HETEROPHORIA QUESTION.

WENDELL REBER¹ sums up interestingly the present status of the heterophoria question. The author believes that no case of heterophoria should be viewed from the muscular standpoint until the refraction has been dealt with thoroughly, and a proper correction worn for from one to two months at least. In 1000 cases 70% were relieved of their symptoms by refractive correction alone. But some individuals reveal insufficiency in their relative accommodation or relative convergence. Anatomical anomalies in the insertion or in the relative power of the muscles produce symptoms not relieved by correction of the refractive errors. The general health of the individual has a most important bearing on the development of symptoms from a heterophoria, as does also occupation. Heredity has some influence in strabismus, and the little that has been done indicates that there are family tendencies to heterophoria. If a patient presents two degrees of esophoria for infinity and anywhere from balance to two degrees exophoria for the reading distance he may be said to have euphoria and to have a pair of eyes well adapted to prolonged use either at infinity or at the reading distance, as far as his eye muscles are concerned. In esophoria not relieved by glasses correcting an associated hypermetropia, the author gives the usual prism exercises and also has found benefit in what he calls lateral rotation, viz: the patient looks straight ahead—then rolls the eyes as far as possible to the right, then back to the primary position and then as far as possible to the left and then back again. This may be done in cycles of four, as many times as can be comfortably borne. Failing exercises, perma-

nent prisms may be considered, and it is by no means true that the prism strength must be gradually increased or that tenotomy is finally reached. As a rule, esophorias with divergence insufficiency are the ones most likely to accept prisms gratefully. Fourteen per cent. of esophoria is in myopic patients; even here prisms are of value. In the author's series of about 500 esophorias he has tenotomized but one. It is not the degree of the esophoria which makes the patient require treatment, but the symptoms which it causes.

Exophoria may be (1) accommodative, when found with myopia; (2) with normal divergence and deficient convergence; (3) with normal convergence and excessive divergence; (4) with convergence and divergence both subnormal.

In 200 cases 75% gave good results under prism exercises, relieving symptoms, even when the degree of exophoria was not reduced. Permanent prisms are of value, especially if exercises are used for training the convergence. Of 500 exophorias studied, only 22 came to operation, preferably a tenotomy gauged by testing at the time of operation. Hyperphoria, differing from esophoria and exophoria, is very constant in its degree, even for years, perhaps because it is often due to abnormality in orbital build or to anomalous insertion of the tendons of the vertical muscles. It is more in evidence in the years from 30 to 50, and complicates presbyopia. Prism exercise has been a failure but rest prisms are of the greatest value, starting with a partial correction and giving enough to make the patient comfortable. The prism often gives permanent relief. The author had a favorable result in 297 out of 376 cases. Thirty cases were operated upon with 26 good results.

DELAYED HEALING AFTER CATARACT EXTRACTION.

Vail² discusses the causes of delayed healing of the wound after cataract extraction. The longest period he found was 49 days, during which the eye appeared the same as it did when the operation was just finished. The causes usually given are too large conjunctival flap, allowing aqueous to accumulate under it and stretching the sclero-corneal surfaces apart; shreds of capsule; tags of iris or vitreous; masses of lens matter; clots in the wound,—all may predispose to gaping wound and delayed healing. Sometimes, perhaps, relaxed tissues and failure to react may delay healing. Anterior detachment of the chorioid may cause an empty anterior chamber, even when the wound is closed. Vail believes that the real cause is an involuntary spastic contraction of the obicularis palpebrarum muscle or a localized tie affecting this muscle which by its alternate contraction and relaxation presses the convexity of the cornea, thus flattening it to a certain extent and causing the aqueous to spurt through the wound in little gushes. Vail saw this occur in one of his cases. He then cut the obicularis ver-

tically at the outer canthus and the wound healed promptly. This was on the 26th day. The same good result followed two other operations, one on the 14th day and one on the 12th.

CATARACT EXTRACTION IN CAPSULE.

Knapp³ reports 100 successive extractions of cataract after subluxation with the capsule forceps. This modification of intracapsular extraction is done with a dilated pupil. A large section is made, with a conjunctival flap, and then an iridectomy. The capsule forceps (of Kalt) is introduced to a point below the center of the pupil and a large piece of capsule grasped. One should pull on the periphery of the capsule, trying not to tear it, and move the instrument up and down and side ways, to dislocate the lens in the capsule. The upper attachment is usually unruptured. Pressure straight back on the lower part of the cornea with Smith's hook causes the cataract to turn a somersault and come out lower edge first. After delivery if the upper edge still adheres, it may be separated by a stroking motion. If the lens does not turn, counter pressure may be needed at the scleral margin. If the capsule ruptures during expression it can generally be grasped and drawn out with the blunt capsule forceps. If a large piece tears out of the anterior capsule, the operation can be done as in ordinary extraction. This dislocation succeeds in from 40% to 50% of the cases, and secures the advantages of removing the cataract in the capsule without the risk of the Smith operation.

PLASMOMA OF LACRIMAL SAC.

Verhoeff and Derby⁴ report a case of plasmoma of the lacrimal sac, the same case having a flat yellowish growth of the conjunctiva of the left lower lid; the caruncle was enlarged and the semilunar fold thickened and also the conjunctiva of the upper tarsus. Pathological examination showed an enormous thickening of the wall of the sac composed largely of plasma cells and containing hyalin masses, some of which represented the remains of arteries and capillaries. It was found that the hyalin was derived chiefly, if not solely, from elastic tissue. Elastic tissue is formed around capillaries and small vessels which are normally without such coats. The conjunctival growth showed the same pathological conditions. This condition is not a pathological entity, but is an early stage of hyaline or amyloid degeneration of the conjunctiva; according to the preponderance of the cellular elements or of the degenerative material, the condition has been termed plasmoma or hyaline degeneration. Clinically the process begins with a painless enlargement of the lids, usually the upper, due to thickening of the conjunctiva, the surface of which is smooth and varies in color from a bright red to a pale yellowish gray or even like wax, according to the stage of the growth. It may bleed on manipulation or if ad-

vanced it may be avascular. Trachoma coexists in one-third of the cases. The process is often checked by excision. The writers believe that the origin of the condition is inflammatory, possibly due to slow absorption of toxin from the conjunctival sac. This is the first case in which this degeneration has been reported in the lacrimal sac.

RELIEF OF LACRIMAL OBSTRUCTION.

The subject of lacrimal obstruction has received much consideration and when probing has failed, and especially when there is a dilatation of the sac with retention of contents, extirpation of the sac has been much used. This removes the menace of foul secretion regurgitating into the eye, but it does not restore drainage of tears into the nose. Various intranasal operations have been devised for draining the sac, and that of West has many advocates. Clark⁵ believes this operation indicated in dacryocystitis, dacryoblennorrhea, in fistula and phlegmon, and in epiphora caused by stenosis in the nasal duct that cannot be cured by a few careful probings. Epiphora caused by trouble at the puncta or in the lumen of the canaliculi or by lack of proper muscular tone in the orbicularis, which in turn prevent the lids from hugging the eyeball,—such conditions would not be relieved by this operation, the object of which is to cause the tears to pass directly into the nasal chamber, thus short-circuiting the duct. Pus, of course, drains from the sac. An opening is cut through the bone of the outer wall of the nose just over the torus lacrimalis, and the lower part of the lacrimal sac which lies in the fossa is cut off or punched out. West began this work in 1908 and improved the operation until in 1914 he reported a series of 200 operations with 90% of cures. The advantages of the operation are: Functioning tear apparatus, no external scar, no epiphora or necessity of removing lacrimal glands, and the operation may be done during an acute abscess. Infection of conjunctiva from the nose after the operation has not been reported.

TREATMENT OF TRACHOMA BY CO₂ SNOW.

Harston⁶ cures his cases in from three to six months, meaning by cure: (1) absence of discharge of any kind, (2) smooth palpebral conjunctiva and no hypertrophy in the conjunctiva of the fornices (3) reduction of pannus to a minimum. Of course gross deformities of the lids from the contracting conjunctiva are not cured. The author has treated 7000 cases as follows: The snow is moulded into a cylinder and sharpened to a point. Under cocaine the snow pencil is applied with firm pressure to the conjunctiva of the everted lids for 15 seconds the first time and for 30 seconds at subsequent treatments. After an interval the lids are replaced. After two minutes the patient can open the eyes. Excessive scarring has not occurred in the author's cases. The reaction goes down in

two weeks or less, and may then be repeated. This treatment induces chronic hyperemia of the conjunctiva like Biers' hyperemic treatment.

SCLEROSTOMY.

Verhoeff⁷ has examined an eye removed for a small intraocular sarcoma seven weeks after a successful sclerostomy done with the Verhoeff punch. A definite bleb had formed and the tension was normal. A delicate connective tissue originating in the tissue of the bleb and not in the sclera had partly filled the fistula. Irregular spaces in this tissue communicated directly with the spaces opening into the anterior chamber. Endothelium did not line these spaces. The scleral fistula showed recent proliferation at the edges and some fibrous tissue formation, making the lumen somewhat smaller than it was in the first place. The outer surface of the sclera beneath the bleb had proliferated also. Descemet's membrane ended 5 mm. from the edge of the fistula. The corneal endothelium did not extend into the fistula. The root of the iris, much thinned, adhered to the corneo-sclera. The bleb consisted of a connective tissue network resembling the unpigmented stroma of the iris. There were here few blood vessels and no infiltration with chronic inflammatory cells. Spaces occurred within the bleb filled with a scarcely visible connective tissue. Some of the large spaces extended up beneath the epithelium. The conjunctiva over the bleb was thinner than normal. The edematous tissue of the bleb passed gradually into the normal conjunctival tissue. The spaces in the bleb were due to distention by intraocular pressure. Holth supposed incarceration of iris tissue in the wound made for better filtration but "certainly it is not essential to successful results for the fistula to be lined by pigment epithelium." Verhoeff believes from this examination that the fluid escapes mostly by way of the surrounding tissue, and not at all through the epithelium of the bleb. The author also suggests that in cases where the tension remains low, where no bleb forms and the scleral fistula has apparently closed, that there is a slow rate of secretion, so that a very small outflow suffices to keep the pressure down, while in other cases, perhaps most cases of hemorrhagic glaucoma, the secretion rate is so high that the pressure remains up even with a very efficient filtration and a large bleb.

SQUIRREL PLAGUE CONJUNCTIVITIS.

Vail⁸ reports a case of conjunctivitis with ulcers which suggested Parinaud's disease. The pre-auricular gland was enlarged and tender. There were systemic symptoms with final recovery. The cause was the *Bacillus tularensis*,—the squirrel plague germ. Sattler⁹ reports a case with severe general symptoms. The eye showed edema of upper lid and swollen conjunctiva with infiltrated points which ruptured and became ulcers. Symptoms lasted five weeks. Inocula-

tion of guinea-pigs gave lesions like those of B. tularensis, and smears showed numerous minute encapsulated coccoids and rods resembling B. tularensis.

BLASTOMYCOSIS OF EYE LIDS.

Jackson¹⁰ calls attention to this condition, often overlooked or wrongly diagnosed. He reports two cases, the first seen by four competent ophthalmologists and the other by two, none of whom recognized the condition. When the lids are involved we see one or more ulcers somewhat resembling epithelioma, but the infiltrated margin is soft and contains minute abscesses throughout its whole extent, and also small abscesses are found in the floor of the ulcer among the granulation tissue. Epithelioma, syphilis and tuberculosis are to be excluded. The mould-like organism constantly found in the abscesses has not yet been classified. It may be a saccharomycete or a more developed plant, as *oidium*. Perhaps more than one species are concerned, as some cases last for years, involving the skin, while there are systemic cases usually going soon to a fatal termination. The local disease has a predilection for the lids and should be recognized before cicatricial changes distort the lids and expose the conjunctiva and cornea. The process is cured by large doses of potassium iodide, which is specific. Painting the ulcers with silver nitrate may favor the local healing.

STUDY OF BITEMPORAL HEMIANOPSIA.

The work of Clifford Walker¹¹ has added greatly to our knowledge of the field of vision, and his improvements in perimetry and ingenious inventions aid in diagnosis, and especially in prognosis after cerebral operations. His papers should be read at length, but some of his points may be quoted here. He says a field examination with only one size of disc is as incomplete as visual examination with one size of letter. The 5 mm. disc may be called the normal disc, and a series of nine discs gives a satisfactory range of from 1.7 minutes to 8 degrees. In anterior lesions, mostly those in the chiasmal region producing bitemporal hemianopsia, large discs detect the earliest improvement after operation. Response to large discs before operation indicates that recovery of functions may be hoped for in the direction of greatest response if satisfactory decompression be obtained. The presence of a temporal island has been found to indicate post-operative improvement. The temporal island has been found almost in the center in the neighborhood of 50 degrees, showing that this is the strongest portion of the temporal field. The process of field recovery after operation is largely the reverse of the process of damage. Cases not showing defects to normal discs should be tested with the smallest series of discs.

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Society Report.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Continued from page 59.)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D.C. After the meeting of the Council the scientific program was taken up.

PSEUDO-POSITIVE WASSERMANN REACTION IN A CASE OF UREMIA AND INTESTINAL TOXEMIA.

Dr. William H. Park of the New York Department of Health has given over 500 consecutive sera and the discrepancies were not so great as might have been supposed.

Dr. RICHARD DEXTER, Cleveland, Ohio: I agree with Dr. Kolmer that the antigens are a variable factor. The result of my observations showed that the cholesterine antigens give a finer test than do others. I recently had a patient who was insane; he was a young man and came under my notice because an examination of the spinal fluid was required. He had been shot through the orbit. The examination of the spinal fluid was negative, but on the week following he developed a syphilitic meningitis and the examination of the spinal fluid has since been positive. It was first thought that he had a staphylococcus infection.

Dr. JUDSON DALAND, Philadelphia, Penn.: I should like to speak regarding the discovery of living spirochaetae pallida after the administration of salvarsan. I really believe that chancres should be primarily excised and the neosalvarsan given. Ehrlich found no spirochaetae and no chance at the expiration of twenty-four hours after the injection. Those present here cannot help but appreciate the work that has been done by Dr. Uhle. The results obtained from the various specimens and various laboratories were very important. It should be remembered by us all that when we get a positive Wassermann, it does not mean that the individual has syphilis; and if we get a negative result, it does not necessarily mean that the patient does not have this disease.

Dr. CLAUDE P. BROWN, Glenolden, Penn.: In a series of cases in which salvarsan was administered the spirochaetae were still present.

Dr. A. A. UHLE, Glenolden, Penn.: I said nothing about the technique but what I have presented was from the clinical standpoint only. In speaking of the Wassermann reaction, serologists say they wish to obviate the causes which give rise to positive reactions. It may be that the cholesterine anti-

gen, or the alcohol antigen, may be better. The workers in this field, however, have as yet no specific antigen which could be in any way relied upon.

In regard to the diagnosis of gummata of the liver, as has been referred to, we have only the clinical history and the family history to guide us; in such a case the use of the antigen is of great diagnostic import. I wonder what it means sending ten samples taken from the same individual under similar conditions to different laboratories and getting returns stating that six of them were positive and four were negative. I think the best we can do is to watch with care the work of different laboratory workers, judge who did the best work, and then to reply upon his interpretations.

There are other things besides the antigens which could account for certain discrepancies: I believe there is to be taken into account the technique. What I have given you is but a preliminary study. We hope in the near future to be able to present some uniform technique, a uniform antigen, and hope that the laboratory will greatly aid in the clinical diagnosis.

THE VACCINE TREATMENT OF RING WORM OF THE SCALP.

DR. ALBERT STRICKLER of Philadelphia, presented this paper. He stated that the vaccine treatment of ringworm of the scalp rested on the fact that there was developed in the blood of children suffering from this affection a specific antibody which produced a positive complement fixation test and gave a positive skin reaction. Dr. Kolmer and the author had found 75% positive fixation tests in children suffering from tinea tonsurans. When they injected 0.56 c.c. of a suspension of dead ring worm fungus in salt solution which had been briefly centrifuged at a low speed—so that it was about the same density as luetin—into the superficial skin of the arm of a child suffering from tinea tonsurans they obtained a reaction in the vast majority of the patients with ring worm, and negative results in their controls. After describing in detail their method of getting the vaccine for tinea tonsurans, the assayed stated that their success had depended on the incorporation of the entire fungus growth in the vaccine, the failure of the ptychophytins of Plato was probably due to the fact that the culture suspension was subjected to filtration. Too much emphasis could not be placed on this point and on the necessity of rubbing up this ring worm growth. From the growth in an ordinary Ehrlen Meyer flask about 500 c.c. of vaccine was made up. To this eight to ten c.c. of chloroform was added to kill the growth, and the vaccine was heated for an hour at sixty degrees C. The use of the chloroform was later discontinued. Controls for living fungi were made on French "proof agar," and for pyogenic organisms on plain agar. The vaccine was preserved by the addition of sufficient phenol to bring it up to 0.25%. It was then tubed in sterile salt solution and was then ready for use.

The vaccine might be employed in doses varying from 0.5 c.c. up to 4 c.c. It had been found of no value to employ a dose as large as the latter, the usual dose varied from 0.5 c.c. to 2 c.c. The injections were at first given at intervals of three days, but later it was deemed advisable to give them every five or six days. The injections were given preferably in the region between the scapulae. The number of injections was from seven in some patients to twenty in others. In no instance was there

any constitutional reaction. After the patient had received six or seven injections, a local reaction in the form of an infiltrated area developed in about thirty-six hours after injection, at the point of injection. In treating a case of ring worm of the scalp, hair infected with the fungus was planted on "French proof agar" according to the technique described both for the purpose of determining the type of infection and for the purpose of treatment. They then injected the patient with their stock vaccine, once every five days, giving five injections: the first 0.5 c.c., and giving 1 c.c. for the second and third injections. They then advised local treatment (cade and olive oil in equal parts) for a period of two weeks, meanwhile giving 1.5 c.c. of the vaccine every six days. This local treatment was then followed by the use of an ointment (sulp. precip. grains 20, and vaseline, one ounce) which might be applied once a day for a period of ten days or two weeks. The vaccine treatment should extend over a period of from two to three weeks. Up to date they have treated at the Philadelphia General Hospital 20 patients with ring worm of the scalp of varying degrees of severity. Of these, fourteen had been cured, two markedly improved, two improved but left before treatment could be properly carried out, three died from measles and one from pneumonia. All of these were treated with vaccines, only a weak ointment being used to stimulate hair growth in three cases. If, after giving seven or eight injections, no improvement is noted, the stock vaccine should be discontinued and an autogenous one employed.

They believe that they had in this method a safe and efficient treatment of tinea tonsurans, and that the x-ray offered no advantages over it.

A STUDY IN BLOOD COUNTS IN RELATION TO VACCINE THERAPY. AUTOINOCULATION IN THE TREATMENT OF MOUTH INFECTIONS.

DR. JOSEPH HEAD of Philadelphia presented this communication. He stated that during the past year, as in the previous years, vaccine had continued to prove of great value in the treatment of mouth infections, but it must not be forgotten that vaccine without effective surgical treatment could be of little service. The assayed showed charts which demonstrated the value of blood counts in the use of vaccines and said that the blood counts had taught him to be more moderate in his dosage, and that he had found that patients responded at least as well, if not better than when the doses were pushed to the point of getting marked reactions. He cited the blood counts in several cases which showed that without them injury might unquestionably have been done by excessive dosage with vaccines. Lymphocytosis did not seem to be as much of a factor as he had thought last year. When he had first undertaken the work he had hoped to be able to make more positive statements than his later knowledge would permit. This was largely due to the difficulty he had had in finding individuals with a normal leucocyte count.

The assayed stated that no paper on mouth infection would be complete without some reference to ameba. He had been using emetine 1/3 of a grain administered hypodermically in the arm or back for ten successive days during the treatment and had felt that as an adjunct it was a great help to the vaccine treatment for mouth infections. But he had also had remarkably good results where the

vaccine was used without emetine, results which for permanency and rapidity of action were never obtained without the vaccine. Neither vaccine or emetine could cure an advanced case of mouth infection unless the primary depots of infection were removed by good dental surgery. In speaking of the real specifics for the cure of pyorrhea, Dr. Head announced that he had one as effective for pyorrhea as the typhoid vaccine for the prevention of typhoid fever. His remedy was the autoinoculation caused by the scientific use of the floss silk and the tooth brush. He showed that the usual method of brushing the teeth was palpably ineffective. The brushes in common use were improperly constructed. They should be smaller and the bristles shorter if the real bristle friction is to be obtained. Another error was the impression that brushing the gums caused them to recede. They should be brushed vigorously. An effective method of mouth cleansing was first that the spaces between the teeth should be swept with dental floss so that all bacterial masses would be moved from the sides of the teeth and gums. This would at first cause bleeding and make the interdental spaces sore. If the infection had not spread beneath the gums beyond the reach of the floss silk, autoinoculation would soon cause a healing that was little less than miraculous. After using the floss silk, the tooth brush should be used with the short flat bristles. By means of motion pictures the writer described the various motions that were necessary for effectually cleansing the mouth and to what extent our present methods failed.

DR. C. C. BASS, Tulane University, New Orleans, La.: The subject of pyorrhea alveolaris has interested me for many months and the more I have studied this disease the deeper do I get. I am at present studying the pathology of the disease and will later take up the study of the bacteriology, then the protozoology and then the treatment of this disease. The information I have gotten during the months of study I have given to pyorrhea alveolaris presents a very appalling result, showing the great prevalence of the disease. It has taken weeks and months to enable us to make a correct diagnosis, and in some cases it has been impossible to make a correct diagnosis. The diagnoses made by the dentists are in fact no better than the diagnoses we make. The average dentist will make a diagnosis of pyorrhea alveolaris when he is able to squeeze pus from the gum or a pocket around a tooth. Whenever he sees a drop of pus, he makes this diagnosis. Sometimes the dentists will say, "There is no Riggs' disease present but simply a loosened tooth." This might be all right—it might be a pyorrhea, or the end of a pyorrhea. This condition I do not believe can be cured by the administration of medicines alone; it calls for surgical treatment. The surgical treatment was more important than any medication dreamed of. In our personal experience we have seen about 500 cases and microscopical examinations were made of all; with proper technique we have found in that number but two adults in whom we were not able to demonstrate pus and the endameba buccalis. Interesting work on this subject remains for those of the future. The endameba buccalis is the essential cause of pyorrhea alveolaris. The endameba does not attack normal tissues. The evidence is strong for a study of the sections of the pathological material at hand, that it is first necessary to have a damaged tissue, some particular tissue that

is susceptible to infection. We are now studying the pathology of the disease and later intend taking up a study of the protozoology and the treatment. We should bear in mind that the endameba buccalis lives and thrives and reproduces in the peridental membrane of the human being, and probably of other animals. This is their normal habitat. They feed upon certain cells that are found only in some suppurative foci. These cells are very numerous in suppurations next to bone tissue. If the endameba was once implanted there, in its natural habitat, it would start growing and reproduce at a rapid rate and cause trouble.

I do not believe in any treatment which does not take into consideration the rôle played by the endameba buccalis. The surgical treatment in this disease is as important as in any other disease. The lesions progress rapidly; there occurs a destruction of the soft parts and then the bone is exposed.

The duration of the disease greatly surprises me. I do not think that more than 5%, at the extreme, escape the infection before they are grown. Many people lose their teeth before the age of 30 years and the molars are the first to be affected. There was a slow sloughing process of from five to 30 or 40 years and dependent upon the bacterial flora in the individual's mouth. Everybody, I believe, would lose their teeth because of this disease if they lived long enough.

FURTHER EXPERIMENTS IN THE PRODUCTION OF IMMUNITY TO TUBERCULOSIS.

DR. GERALD B. WEBB and DR. GEORGE BURTON GILBERT of Colorado Springs, Colo., presented this communication. They recalled what they had previously shown that a thick emulsion of blood platelets added to a lethal dose of tubercle bacilli appeared to modify the course of the infection or to prevent it. However, this did not furnish a practical, safe and reliable method of inoculating living virulent bacilli for purposes of immunization. It had seemed desirable in view of the importance attached to the rôle of the lymphocyte in nature's battle against tuberculosis, to determine whether an immunization of lymphocytes added to a lethal dose of tubercle bacilli could influence or prevent infection. Lymphocytes were obtained by injecting 4 c.c. of sterile Ringer's solution into the peritoneal cavity of guinea pigs, and about ten minutes later withdrawing some of the fluid by means of capillary pipettes and immediately mixing with a definite number of bacilli in a capillary pipette by means of the Barber method. After incubating for twenty minutes this mixture was inoculated subcutaneously in the nipple area of adult guinea pigs. Samples of the fluid obtained from the injected guinea pigs, when strained, showed a practically pure emulsion of lymphocytes, at least 95%, at the time chosen as most favorable. Both normal and tuberculous guinea-pigs were used for obtaining the leucocytes in different experiments without appreciable difference in the results. The formation of a fibrin network which collected the lymphocytes and permitted only a perfectly clear fluid to be withdrawn from the pipettes was overcome by having the doses of living bacilli already picked out in several pipettes so that they would be mixed with the lymphocytes at once. In one experiment, serum, both heated to 56 c. and unheated, from both normal and tuberculous guinea pigs, was added to the lymphocytes bacilli mixture and the whole incu-

bated before inoculation. In this series of five experiments a uniform and constant action by the lymphocyte emulsion so far as actually preventing infection could not be detected. Indeed any uniform modification of the course of the disease also seemed to be lacking. The tabulated data of these experiments was present and also the autopsy results.

CONCERNING THE OCCURRENCE OF TUBERCLE IN THE CIRCULATING BLOOD.

DR. LOUIS HAMMAN, Baltimore, Md., presented this paper and commented upon the unsatisfactory state of our information concerning the occurrence of tubercle bacilli in the circulating blood. Literature on the subject is full of the grossest contradiction. Some authors claim they find the bacillemia in all cases of tuberculosis; others that they discover tubercle bacilli in the blood only in the last stages of the disease; still others that they find them even in the last stages of the disease only exceptionally.

The results of microscopical examination of the blood are unreliable, since there are so many possible sources of error; but even by animal experimentation, some authors report a very large number of positive results; some, indeed, as high as 50% of the cases examined.

My investigation of this question upon patients in advanced stages of pulmonary tuberculosis and in animals inoculated intravenously, leads me to draw the following conclusions:

Tubercle bacilli occur in the blood in sufficient number to be demonstrated by animal experiment only in the very last stages of pulmonary tuberculosis in human beings, and then only infrequently. In animals they are constantly found when a very large number of organisms is injected intravenously. When smaller numbers are injected, and the disease remains localized relatively to the lungs, no bacillemia occurs until towards the end of the investigation, when the disease becomes general.

DISCUSSION.

DR. GERALD B. WEBB of Colorado Springs, Colo.: It is puzzling to men who are working on tuberculosis to know how to interpret the various results they obtain regarding the occurrence of the tubercle bacilli in the circulating blood. Anyone who studies the growth of the tubercle bacilli in the incubator realizes what a sticky mass there is to deal with. The typhoid bacilli, as you know, made no such sticky emulsion, but with the tubercle bacilli it is different. In their work in inoculating this bacillus it is extremely difficult to do the work because of this stickiness. In these cases of bacillemia, the tubercle bacilli are said to be frequently found in the circulating blood. The clinicians must realize that they did get in. They must get there through the circulating blood stream and settle in certain regions. Dr. Webb asked Dr. Hamman what he knew regarding the type of the tubercle bacilli described by Langduzyns, that was, the typhoid type of bacilli.

THE VIRULENCE OF VARIOUS STRAINS OF HUMAN TUBERCLE BACILLI.

DR. GEORGE BURTON GILBERT and DR. HAROLD GREGG of Colorado Springs, Colo., presented this preliminary report. They said that the use of live

bacilli for the production of immunity had been of little avail because of their inability to control the exact numbers and the virulence of the bacilli. The ingenious device of Professor M. S. Barber made it possible to isolate and inoculate any given number of virulent tubercle bacilli. Using this same method it has been possible to show great variation in the minimum lethal dose of different virulent cultures. The authors presented a list of certain cultures and the smallest number so far found capable of producing progressive and fatal tuberculosis in adult guinea pigs. In an effort to obtain a culture of moderate virulence for future work along immunological lines, it was decided to obtain a large series of tubercle bacilli from different types of cases and from different organs of the body, and then to study these in detail as to virulence. The cultures were obtained using the media recently advocated by Petroff, consisting of one plus 10,000 gentian violet, two parts of whole egg and one part meat juice. Definite number taken from the fresh cultures less than one month old were inoculated subcutaneously in the nipple area of adult guinea pigs. Both local and internal lesions were studied. Owing to the lack of guinea pigs, only six cultures could be reported on at the present time. The tabulated results with the various cultures showed the absence of both local lesions and local regional glands in seven instances where macroscopic disease was found in one or more internal organs. This was quite unusual in their experience. It was certainly safe to assert that great differences in virulence occurred in virulent cultures obtained from various cases. Whether cultures obtained from varied organs varied regularly in virulence remained to be determined.

THE DIRECT TREATMENT OF CEREBROSPINAL SYPHILIS ACCORDING TO THE METHOD OF SWIFT AND ELLIS.

DR. CLYDE L. CUMMER and DR. RICHARD DEXTER of Cleveland after outlining quite fully the work of Swift and Ellis in the treatment of syphilitic diseases of the central nervous system, and reviewing a number of the reports of others who had employed this technique, concluded that from this work one gained the impression that the definite changes could be brought about in cases of paresis, but that the permanence of the improvement was still open to question. There was no doubt that many cases of tabes and cerebrospinal syphilis had been markedly improved symptomatically and that the laboratory findings in certain cases had returned to normal. Practically no changes had been recorded in the deep reflexes or the pupillary responses in tabetics. Certain criticisms of this method had been made, one being its danger. A careful search of the literature showed that the reported deaths had been among paretics, and no fatalities had occurred after the treatment of tabetics. The number of fatalities in the total number of treatments was not alarming, considering the desperate outlook in this condition. Another criticism was that arsenic had access to the spinal fluid when present in the blood stream, and therefore its direct introduction into the subarachnoid space was needless. This point was at least open to argument, since Camp stated that he was unable to discover arsenic in the subarachnoid fluid after salvarsan had been administered intravenously. The main question was whether this method of treatment was productive of symptomatic and functional improvement as well as the indubitable

improvement in laboratory findings. It was to aid in answering this question that this series of cases was reported. While the number of cases was limited, the value of the report was enhanced by the length of time through which they had been able to continue their observations. In addition to two preliminary cases that were under their care for so short a time that they could not be considered, they had treated eight patients suffering from definite *tabes dorsalis* or syphilitic meningo-endarteritis. They had followed rigidly the Swift-Ellis technique which they outlined. Their cases were divided into three classes accordingly as they showed decided clinical improvement, moderate or slight clinical improvement, or had been under observation so short a time that it was unfair to draw conclusions. The cases were all reported in detail and carefully tabulated records of the laboratory findings were presented. The first patient, a man of 29 years having cerebrospinal syphilis, had been under observation for over two years. During this time he had received twelve intravenous injections of salvarsan or neosalvarsan (the total being equivalent to 5.4 g. of salvarsan), and seven injections of serum intraspinaly. In addition to this, much mercury had been given in the form of intramuscular injections and inunctions. He now reported that he had had only one attack of pain during the past year. The second case was one of only moderately advanced *tabes dorsalis* in a man of forty-five years of age, in whom serologically there was marked improvement. The neurological physical examination showed absolutely no change except a restoration of sensory perception. From a functional and symptomatic standpoint this patient was vastly improved.

The third case was also one of moderately advanced *tabes dorsalis* who had been under observation for eleven months and, clinically, his case was one of great betterment. The pains had disappeared except for recrudescence in a mild form when fatigued. Physical examination showed no change in pupils or reflexes, but the Romberg sign was less marked and the muscle sense was improved. The laboratory findings were the most gratifying in the entire series. In the fourth case, one of early *tabes* in a woman 34 years of age, the improvement after the institution of intravenous and intraspinal treatment was rapid and striking. The laboratory finding was most satisfactory while the clinical result was the most striking in the series. The pupillary reaction and the ankle and knee jerks were unchanged. The fifth case was one of moderately advanced *tabes* in a man 39 years of age. The clinical results in this case were a restoration to economic efficiency, a marked gain in weight, and a removal of certain unpleasant symptoms due to the marked sensory changes which occurred early in the condition. The laboratory findings in this instance were greatly improved. Of the class showing moderate or slight improvement, one of advanced and one of moderately advanced *tabes*, the latter was notable in the entire disappearance of the Wassermann reaction. The spinal fluid of the advanced case showed no improvement over the first, barring the reduction in the cell count. After reviewing the histories of the cases that have been under treatment too short a time to enable one to draw any conclusions, they summarized their work as follows. They had given forty eight intraspinal injections of serum, and seven treatments of a similar nature not reported in detail, making a total of 555. They had had no untoward or unfortunate results in any

instance. With all the patients but two, sharp reactions had occurred following the intraspinal injections. When any form of crisis or lancinating pain had been present, the reaction had usually taken the form of an exacerbation of this symptom. The greatest improvement had usually followed the severest reactions.

With reference to changes in laboratory findings, study of the table showed that lymphocytosis disappeared quite promptly, after one, two, or three injections. The globulin test was usually slowest to disappear. In their experience the Wassermann reaction was the most obdurate of the laboratory findings. Practically the only changes in the physical condition which they had been able to detect had been restoration of sensation, when this had been impaired, disappearance of Romberg's sign, increase in muscular strength, and a diminution in ataxia. In no instance had they noted pupillary reactions return to normal, nor had absent deep reflexes reappeared. The greatest improvement had been obtained in symptoms. Lancinating pains had disappeared entirely or were greatly diminished, and in one instance gastric crises had disappeared. The striking feature was the improvement in general condition, in weight, strength, and well being.

In conclusion they felt that they could state fairly that the Swift-Ellis method was safe when the original technic was followed painstakingly. Persistence was necessary to obtain the best results. This treatment was a valuable adjunct in the treatment of syphilitic disease of the central nervous system. The claims of the originators were sustained as far as *tabes* and central system syphilis was concerned. It was a method which was not necessary in all cases, but applied carefully and controlled intelligently it would bring about a definite amelioration in laboratory signs and in symptoms where the accepted forms of treatment had failed.

(To be continued.)

Book Reviews.

Record Book for Measured Feeding. By WILLIAM R. P. EMERSON, M.D., Professor of Pediatrics, Tufts Medical School. Boston: F. H. Thomas Company. 1915.

This record book consists primarily of a number of pages properly ruled for the accurate keeping of the diet and its caloric value. At the beginning is given a list of the amounts of all the ordinary articles of diet required to yield 100 calories, with the proportion of the calories yielded by the protein, fat and carbohydrate. Instructions are also given how to calculate the number of grammes of the different food elements from the number of calories taken. Tables are given of the heights and weights of children and adults, and of the caloric requirements at various ages. This record book should be of value to all those for whom it is necessary to keep an accurate record of their diet.

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CONSTITUTIONALITY OF THE HARRISON AND SHERLEY LAWS.

IN the weekly report of the United States Public Health Service for December 10, 1915, is recorded a decision by the United States District Court for the western district of Washington, relative to the constitutionality of Section 8 of the Harrison Narcotic Law. This section provides that possession or control of the habit-forming drugs named in the act, by a person who has not registered and paid the special tax, is unlawful, and such possession or control is made presumptive evidence of violation of the act. The case in question was made a test case to determine as a precedent the constitutionality of this section. The justice, Judge Neterer, after summarizing the case and citing previous decisions, proceeded as follows:

"The purpose of the drug act in issue is expressed in its title:

An act to provide for the registration of, with collectors of internal revenue, and to impose a special tax upon, all persons who produce, im-

port, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations, and for other purposes.

I think we may assume, and that the court will take judicial notice of the fact, that no opium is grown or produced in this country, and that the purpose of the act is to prohibit the importation of opium. The laws with relation to such importations have become more stringent with each succeeding enactment.

Section 1 of the act in question provides, among other things:

That on and after the 1st day of March, 1915, every person who produces, imports, manufactures, compounds, deals in, dispenses, sells, distributes, or gives away any opium or coca leaves or any compound, manufacture, salt, derivative, or preparation thereof, shall register with the collector of internal revenue of the district his name or style, place of business. . .

And it further provides:

At the time of such registry, and on or before the 1st day of July annually thereafter, every person who produces, imports, manufactures, compounds, deals in, dispenses, sells, distributes, or gives away any of the aforesaid drugs shall pay to the said collector a special tax at the rate of \$1 per annum.

Section 2 provides a lawful and legal method of acquisition by any person entitled to have possession of these drugs.

Section 8 provides:

That it shall be unlawful for any person not registered under the provisions of this act, and who has not paid the special tax provided for by this act, to have in his possession or under his control any of the aforesaid drugs, and such possession or control shall be presumptive evidence of the violation of this section and also of the violation of the provisions of Section 1 of this act. . .

the purpose of Congress being to prohibit the importation, manufacture or sale of the drugs described; and by this act the drug became an 'outlaw' in the country; its presence Congress has the right to trace, and has the power to punish any person in whose possession this 'outlawed' article may be found. The possession of such drug or control thereof is made presumptive evidence of the unlawful importation, manufacture, etc., as well as an obligation to pay the special tax provided by the act, and a failure to register and pay the tax as provided in Section 1 would be a fraud upon the United States, in that it deprived the Government of the revenues provided by the act.

In *United States v. Stowell* (133 U. S., 1; Sup. Ct., 244; 33 L. Ed., 555) the court says:

By the now settled doctrine of this court, notwithstanding the opposing dictum of Mr. Justice McLean in *United States v. Boxes of Sugar* (7 Pet. [32 U. S.], 453, 463; 8 L. Ed., 745) statutes to prevent frauds upon the revenue are

considered as enacted for the public good and to suppress a public wrong, and therefore, although they impose penalties or forfeitures, not to be construed, like penal laws generally, strictly in favor of the defendant, but they are to be fairly and reasonably construed, so as to carry out the intention of the legislature.

Congress, having the power to exclude the drug entirely from the United States, and the right to regulate its relation to interstate commerce, and to levy a tax, must be held to have the right to make it unlawful for any person who has not complied with the provisions of the act by registration or paying a tax, to have in his possession this 'outlawed' article. The act must be construed as a whole, and force given to every part when this can be done."

The court, therefore, decided that the defendant's demurrer to his previous conviction should be overruled and that this section of the Harrison Narcotic Law stands as constitutional.

In the weekly report of the United States Public Health Service for December 17, 1915, is recorded a further judicial decision in construction of Section 8 of the Harrison Narcotic Law.

In a series of five test cases the United States District Court for the state of Montana rendered in part the following as its opinion:

"Of the act referred to in the indictment (Acts 63d Cong., 3d sess., c. 1), section 1 provides that 'every person who produces, imports, manufactures, compounds, deals in, dispenses, sells, distributes, or gives away opium or coca leaves or any compound, manufacture, salt, derivative, or preparation thereof, shall register with the collector of internal revenue of the district his name or style, place of business, and place or places where such business is to be carried on,' and on or before the 1st day of July annually thereafter shall pay a special tax; and also that it shall be unlawful 'to produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away' any such drugs without having registered and paid the tax. Section 8 provides that it shall be unlawful for any person not registered under the act and who has not paid the tax to have in his possession any of the drugs, and also that possession of any of the drugs shall be presumptive evidence of violation of both sections 1 and 8. Section 9, read in connection with section 335 of the Federal Penal Code (Act Mar. 4, 1909, c. 321, 35 Stat. 1152 [Comp. St. 1913, sec. 10509]), makes any violation of the act a felony. The act, whether of police or revenue, is of good purpose. What it will accomplish is another matter.

Any person convicted of its most violent violation—the most law-abiding druggist or physician or like person in legitimate possession of the drugs, who inadvertently allows the annual tax to become delinquent for a day—though fined but \$1, is made a felon and infamous. And this

for a mere legal infraction, and not a true crime, is a consequence shockingly disproportionate to the offense, is antagonistic to sound criminal economics, and is abhorrent to justice. It goes without saying that because thereof under such laws prosecutions halt and convictions fail in many cases, its effect is usurpation of the pardoning power, unequal administration of criminal law, and favored and disfavored classes of offenders; the inevitable result being resentment and prejudice against courts and government, law and order, and impairment of and danger to the general well-being of society. All these evils could and ought to be avoided by repeal of section 335 and its arbitrary stamp of felony and infamy upon so many petty violations of laws of the United States.

In the instant cases, aside from constitutional objections urged, but unnecessary to further note, defendants maintain (1) that mere consumers of the drug and in possession of same only for their own consumption are not by the act required to register and pay the tax, and (2) that the indictments do not show that defendants are of any of the classes by the act required to register and pay the tax. The prosecution contends contra the first proposition, and that in view of section 8 aforesaid there is no support in principle for the second.

Having in mind that taxes can be imposed and statutory offences created only by direct, clear, and apt language, it seems clear that there is nothing in the act imposing the duty of registration and payment of taxes upon mere consumers of the drugs. They are not within section 1, and section 8 does not purport to extend the registration and taxation features of the act to them, or to any one, but only to make unlawful mere possession of the drugs by any person of the classes by section 1 required to register and pay, and who have not, and to create a statutory rule of evidence.

And this latter has misled the prosecution to believe that the essentials of the offense need not be set out in the indictments, but only this rule of evidence—the possession of the drugs, from which in some cases the offense may be inferred; that is, in the cases of those by section 1 required to register and pay the tax. Whenever an offense can be committed by only certain classes of persons, the indictment must expressly allege that accused is of those classes or it is fatally defective in substance; for lacking such allegation, all alleged may be true, and accused be innocent. Furthermore, lacking such allegation, the uncertainty of these indictments is such that defendants might be repeatedly tried on the like and be unable to plead former judgments in bar. Indeed, the prosecution states that, though they are duplicates in form and substance, some of these indictments are against mere consumers of the drug."

Finally, in the weekly report of the United States Public Health Service for December 24, 1915, appears a third judicial decision, holding that the law does not limit the amount of habit-forming drugs which may be prescribed under the Harrison Narcotic Law. This opinion was delivered in a case in which a physician, who had registered and paid the tax, was indicted for alleged violation of the law, the charge being that he prescribed drugs enumerated in the act in quantities more than were necessary to meet the immediate needs of the patient, and that he did not prescribe in good faith and as a medicine. The opinion, as rendered by Judge McCall of the United States District Court for the Western District of Tennessee is in part as follows:

"The defendant demurs to the indictment upon seven grounds. The first five are overruled. The sixth and seventh will be considered together, and are to the effect that the acts of the defendant averred in the indictment are not prohibited by law, nor are they in violation of any law of the United States.

"The indictment is drawn under section 2 of the act of Congress approved December 17, 1914, known as the Harrison Anti-Narcotic Law. Section 2 provides: (1) That it shall be unlawful for any person to sell, barter, exchange, or give away any of the drugs mentioned in the act, except in pursuance of a written order of the person to whom such article is sold, bartered, exchanged, or given. (2) Every person who shall accept any such order, and in pursuance thereof shall sell, barter, exchange, or give away any of the aforesaid drugs, shall preserve such order for a period of two years. (3) Every person who shall give an order as therein provided to any person for any of the aforesaid drugs shall, at or before the time of giving such order, make or cause to be made a duplicate thereof, on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue, and in case of acceptance of such order shall preserve such duplicate for a period of two years. It is further provided that nothing contained in section 2 shall apply to the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist or veterinary surgeon, registered under the provisions of the act, in the course of his professional practice only: *Provided*, That such physician, dentist or veterinary surgeon shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date and the name and address of the patient, to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed to a patient, upon whom such physician, dentist or veterinary surgeon shall personally attend, and such record

shall be kept for a period of two years from the date of dispensing or distributing such drug.

"An attentive examination of the indictment discloses that the offense with which the defendant is charged is dispensing, distributing, and prescribing the prohibited drugs in *quantities more than was necessary to meet the needs of a patient*, and that they were not distributed, dispensed, and prescribed *in good faith* and as a medicine.

"As I understand section 2 of the act, the only thing required of a person, who shall give an order as provided in said section for the drugs mentioned in the act, is that he shall make or cause to be made, at the time of giving the order, a duplicate thereof, on a form issued by the Commissioner of Internal Revenue, and in case of the acceptance of said order he shall preserve such duplicate for two years. The defendant is not indicted for failure to do either of these last-mentioned things.

"Subsection (a) of section 2 provides that nothing contained in the section shall apply to physicians, dentists, or veterinary surgeons, registered under the act, who dispense or distribute any of the drugs in the course of their professional practice, provided that they shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date, and the name and address of the patient to whom such drugs are dispensed or distributed, unless the physician shall administer them personally to the patient. But the defendant is not indicted for violation of subsection (a) but, as has been said, he is indicted for giving a prescription for said drugs in *quantities more than was necessary, and not in good faith and as a medicine*.

"I fail to find in the act of Congress under examination any language making the doing of the things with which the defendant is charged a violation of law. In other words, there is no limit fixed to the amount of said drugs that a physician may prescribe, nor is there any duty imposed upon him, other than to keep a record of all such drugs dispensed by him, and the name and address of the patient, except those to whom he may personally administer, and that he must preserve the records for a period of two years. For failing to do either of these things he is not indicted.

"The result is, I think, the sixth and seventh grounds of the demurrer are good, and an order will be entered quashing the indictment."

These three recent judicial decisions dealing with different aspects of the Harrison Narcotic Law, are of significant importance in determining the constitutionality and interpretation of certain provisions of that law, which have hitherto afforded cause of uncertainty or disagreement.

In this connection there is similar interest in another recent decision by Justice Hughes of the United States Supreme Court relative to and upholding the Sherley amendment of 1912 to the federal pure food law. After ten years of legislation and litigation, this decision should settle definitely the interpretation of this law and enable prosecutions to be made under it. There had been considerable discussion following a previous decision of the court relative to the application of the provisions of this law to misbranded drugs and medicines.

"For a time it was argued by Government officials that the 1906 pure food law, designated as misbranded drugs or medicines accompanied in interstate commerce by knowingly false statements about the curative effects of the compounds. The Supreme Court decided, however, that the 1906 law applied only to misbranding as to the identity or composition of drugs.

"In response to a resulting message from President Taft in 1912, Congress enacted the Sherley amendment, which the Supreme Court held yesterday struck precisely at misstatements either on the label or in printed circulars accompanying medicines.

"We find no ground," said Justice Hughes, "for saying that Congress may not condemn interstate transportation of swindling preparations accompanied by false and fraudulent statements as well as lottery tickets."

"The decision was announced in the case of a Chicago drug concern which shipped medicine from Chicago to Omaha, described in an accompanying circular as a compound which it knew had cured and would cure tuberculosis. The Government proceeded under the Sherley amendment to confiscate the product and the Nebraska Federal District Court condemned the shipments."

The confirmation of this action by the Supreme Court is an important step in the movement aimed at the elimination of the patent medicine evil.

LEPROSY IN THE PHILIPPINES.

IN the issue of the JOURNAL for July 8, 1915, we commented editorially on recent work in the treatment of leprosy in the leper colony at Molokai, Hawaii, particularly with reference to the use of chaulmoogra oil. In the January number of *World's Work* is a particularly interesting article by Dr. Victor G. Heiser of the United States Public Health Service on the study and control of leprosy in the leper colony at Culion

in the Philippine Islands. Especially noteworthy is his encouraging account of the success of treatment with chaulmoogra oil, and the report that twenty-three lepers so treated have been discharged from Philippine hospitals as cured.

For centuries it has been a tradition in Eastern countries that leprosy could be cured by drinking chaulmoogra oil, and many stories were prevalent of cures. Several years were believed to be necessary for a cure, but as the oil is very nauseating, few could keep up the treatment for more than a few months. A method has now been devised whereby the oil is mixed with camphorated oil and resorcin, and given hypodermically. This treatment is being used not only in the Philippines, but in the leper colonies of Hawaii, the Straits Settlements, the Malay States and India, and everywhere it is resulting in most satisfactory progress. If this loathsome malady, one of the oldest in the history of the world, has found its conqueror, the generous efforts of our Government to develop and provide means of carrying on this treatment are indeed commendable.

Dr. Heiser sums up the results of the treatment so far, as follows: It produces apparent cures in some cases, causes great improvement in many others, and arrests the progress of the disease in every instance in which it has been tried.

When the United States took up the treatment of leprosy in the Philippines there were about six hundred cases in the Island, and because of the freedom allowed the sufferers, about one thousand each year were contracting the disease. To segregate this large number of victims it was deemed necessary to reserve one of the islands of the group and remove to this every leper or person suspected of having the disease. The Island of Culion was chosen, as being well located, sparsely inhabited, having plenty of fresh water, an excellent harbor, and offering excellent opportunities for the lepers to engage in agricultural pursuits. To bring a complete town into being, lay out streets, erect over 400 dwelling houses, a theatre, town hall, school building, equip it with a water, sewer and lighting system, build docks and such other modern conveniences as one would expect to find in a well-ordered town, was a colossal task. At one time 300 laborers ran away at the first report that a shipload of lepers was to arrive on the island. Skilled mechanics had no desire to

undergo the isolation, and the class that could be induced to go often lacked skill and made blunders which sometimes took months to correct. There was no telegraph, and mail steamers arrived only once every three weeks. Many of the building materials had to be obtained in the United States or Europe, and this alone required six months or more. Ultimately, however, it was accomplished. While the construction work was in progress a campaign of education was being carried on throughout the Philippine Islands. The danger of contamination by lepers was impressed upon the people, and pictures of the colony at Culion were shown. If possible, it was desirable to induce the lepers to go to the colony without the use of force. The means used were successful, and although families had to be broken up, husbands and wives and children and parents separated, the colony was filled by the voluntary action of the lepers themselves. In all, 8000 persons were transferred to the colony, and the colony numbers today about 3500 lepers. The lepers are given all possible liberty. They organize their own police force, elect their own councilmen and mayor and take some care of the island. It was hoped that they might engage in sufficient farming to supply themselves with food, but because of their natural tendencies and the effects of their disease, few can be induced to any activity in this pursuit. The question of cattle raising is now under consideration. This promises to be an occupation in which lepers might be successful on account of the fact that cattle do not contract leprosy. To stimulate some industrial activity among the patients, a store has been established and a special currency coined for the exclusive use of the lepers, the denominations being the same as those of the regular Philippine currency.

Considering the possible result of an almost entire eradication of leprosy from the Philippines and the successful treatment of the disease by this new method, the outlook for controlling this malady is indeed encouraging.

OPENING OF INFANTS' HOSPITAL.—Invitations are issued by the president and directors of the Infants' Hospital to the formal opening of the new building, 55 Van Dyke Street, Boston, on Thursday, January 20, 1916.

The speakers will be President Charles W. Eliot, Dr. John Collins Warren, and Dr. John Lovett Morse. Dr. Clarence J. Blake will preside, and the new George A. Draper Ward will be opened for inspection.

PSYCHOLOGICAL STUDY OF CRIMINALS AT THE MASSACHUSETTS STATE PRISON.

In a previous issue of the JOURNAL we commented on the results of the examination of the mental status of 47 prisoners in the Massachusetts State Prison. The State Board of Insanity now prints in its latest bulletin (No. 16) the results of the examination of 53 more prisoners, and will publish in a third report the completion of its examination. Summarizing the total number of one hundred cases, the diagnoses made are as follows:

Not presenting any definite abnormal condition..	38
Feeble-minded	23
Alcoholism	13
Border line	6
Insane	4
Giving history of attacks of insanity	4
Morphinism	3
Psychoneurosis	1
Homosexual	1
Not determined	7

Dr. A. W. Stearns, who has conducted the examinations, makes the following comments:

"The large group of 38 can hardly be called normal. Many present decided peculiarities, both physical and mental. But few are well-poised men of ability. However, as this study does not go beyond general psychiatric limits, no attempt will be made to further classify this group.

"From the history and examination of 47 cases, mental defect was suggested, so that they were referred to the psychological examiner. Twenty-three of these showed an intellectual age under twelve, and so were classed by him as feeble-minded. A few would perhaps not be considered committable by an alienist; a few not included in this group might be considered committable. Almost the whole group would very properly be committed under the defective delinquent act, if it were in effect.

"Thirteen cases were classed under alcoholism. Although a much larger number of patients drink habitually, and a good many to excess, only those have been put in this group who are confirmed inebriates or whose drunkenness seemed directly responsible for the crime.

"On account of unwillingness to talk, physical illness, etc., seven patients could not be examined with sufficient thoroughness to warrant a diagnosis.

"Six cases showed undoubted evidence of defect, but as their intellectual age was at the point of division between feeble-minded and not feeble-minded, they have been called border-line cases.

"The small size of the insane group (4 cases) is accounted for by the fact that during the past

year there have been 16 commitments as insane from the State Prison to Bridgewater. Two of these patients have been to Bridgewater but have later been returned. The other two have been committed to Bridgewater since examination.

"Four patients are now sane, but give a history of an attack of insanity. These cases have all been committed to Bridgewater and then returned recovered."

From this work, so far as it has gone, several conclusions may be drawn. In the first place, it will be seen that over one-half of all cases come within the legitimate field of psychiatry. The large number of feeble-minded certainly need special care. It also seems that examination after sentence, though valuable, is not to the best interests of the patient. If the condition of these patients were known, and each patient's best treatment—provided such treatment did not conflict with the interests of society—were the motive behind penal procedure, a different course might often be adopted.

In the absence of any adequate examination before sentence, it would seem wise that a thorough study be made of each case upon admission to Charlestown. This would probably require the entire time of at least one social worker, one psychological examiner, with the part time of a psychiatrist and of the prison physician. The insane and feeble-minded might be immediately transferred to Bridgewater. The result of such study would be extremely valuable: first, in determining the handling of any given case while in prison; next, in considering the matter of parole or pardon; and finally, in case of subsequent arrest.

INFLUENZA, PNEUMONIA AND ACIDOSIS.

In last week's issue of the JOURNAL we commented editorially on the epidemics of acidosis and influenza, then prevalent in the community. The succeeding days mark a rapid wane of the former infection. On January 9 two new cases were reported in Belmont, Mass., one of which has since died and the other recovered. A death from acidosis also occurred in Everett, Mass. The prevalence of respiratory infections, however, has continued, though abated in a considerable degree. During the first nine days of January there were 104 deaths from pneumonia and fifteen from influenza in Boston. On January 10, ten deaths from pneumonia and two

from influenza were reported. The period of extreme cold weather which occurred at this time had the effect still further of checking the spread of the infection. On January 12, there were only five deaths from pneumonia and none from influenza. During the four days ended at noon on January 12, there were forty-four deaths from pneumonia and ten from influenza. During the week ended January 15, there were in Boston 19 deaths from influenza and 73 from pneumonia.

Report from Providence, R. I., on January 9, states that a similar epidemic has prevailed there, especially in all public institutions.

It has been suggested by Dr. Mahoney, as Boston city health commissioner, that the state health department should make minor respiratory infections reportable in order that there might be more accurate information of their prevalence as endemics in different communities. The lesson of the present epidemic in Boston should be that if recurrence of similar visitations is to be prevented, there should be some method for the prompt isolation and treatment of the early cases, from which the later widespread distribution of sickness is derived.

TREATMENT OF NEPHRITIS AND CARDIAC DISEASE.

We desire again to call attention to the JOURNAL's new department of therapeutic and preventive medicine, which for the present issue, is placed in a leading position in our columns. Dr. Phipps's article on nephritis presents some of the latest practical advances in the treatment of that disease.

In another column, in an original article, which might appropriately have been included under the same heading with the foregoing, we take pleasure in publishing a useful paper by Dr. Wentworth, summarizing the practical treatment of cardiac affections in children from the standpoint of an out-patient department which in many respects is essentially that of the busy practitioner. Particular attention is called to this latter article, as the first of a series, by Dr. Wentworth and other authors, on various aspects of the problems presented in the scientific study and clinical management of cardiac diseases in various classes of patients and under varying conditions. Further articles of this series will appear in subsequent issues of the JOURNAL during this winter and spring.

MEDICAL NOTES.

TRANSFER OF NEW YORK QUARANTINE.—Report from Washington, D. C., states that on January 12 the quarantine offices of the port of New York were temporarily transferred from state control to the federal supervision of the United States Public Health Service. This transfer of jurisdiction will continue in force until the New York General Assembly passes legislation to make it permanent. This action placed under federal control all American ports with the exception of Baltimore. Surgeon-General Blue has detailed Dr. L. E. Cofer of the Public Health Service to take charge of the New York station.

PREVALENCE OF MALARIA, PELLAGRA, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for December 31, 1915, states that during the month of November in that year there were in Mississippi 11,764 cases of malaria, 739 of pellagra, 72 of smallpox and 562 of typhoid fever. During the same period there were in Kansas six cases of poliomyelitis, 232 of smallpox and 192 of typhoid. There were 156 cases of smallpox and 43 of typhoid in Wisconsin; 127 of smallpox and 133 of typhoid in Indiana; 146 of smallpox in North Dakota and 55 of typhoid in Washington.

BUBONIC PLAGUE IN INDIA.—During the ten months from January to October, 1915, inclusive, there were reported in India, 427,381 cases of bubonic plague with 347,821 deaths. The distribution of the disease was almost universal, except that there were no cases in Assam, few in Coorg, and in Bengal the disease was confined chiefly to Calcutta.

TYPHUS FEVER IN RUSSIA.—Report from Warsaw on December 17, 1915, states that on that date there were in that city 897 cases of typhus fever, of which 800 were among refugees.

AMERICAN ASSOCIATION OF ANATOMISTS.—At the recent annual meeting of the American Association of Anatomists in New Haven, Conn., the following officers were elected for the ensuing year: President, Dr. Henry H. Donaldson, Wistar Institute; vice-president, Professor Clarence M. Jackson, University of Minnesota; members of the executive committee, Professor Eliot R. Clark, University of Missouri, and Professor Reuben M. Strong, University of Mississippi. Professor C. R. Stockard, Cornell Medical School, New York City, remains secretary of the Association.

AWARD OF MOXON AND LEEUWENHOEK MEDALS.—It is announced that the Moxon gold medal has been awarded by the Royal College of Physicians of London to Dr. Dejerine, pro-

fessor of diseases of the nervous system in the medical faculty of Paris. This medal is awarded triennially for distinguished research in clinical medicine. Its previous recipients have all been British physicians,—in 1891 Sir Alfred Garrod, in 1894 Sir William Jenner, in 1897 Sir Samuel Wilkes, in 1900 Dr. William Tennant Gairdner, in 1903 Dr. John Hughlings Jackson, in 1906 Dr. Jonathan Hutchinson, in 1909 Sir William Richard Garvers, and in 1912 Sir William David Ferrier.

It is announced that the Leeuwenhoek gold medal has been awarded by the Royal Academy of Sciences of Amsterdam to Surgeon-General Sir David Bruce, in recognition of his discovery of the micrococcus melitensis as the etiologic agent of Malta fever. In addition, Dr. Bruce discovered the trypanosome which is the cause of nagana or African cattle fever, transmitted by the tsetse fly, and made extensive researches into other African tropical diseases, especially the sleeping sickness. The Leeuwenhoek medal is awarded decennially for the most important work done during the decade on microscopic organisms, and in commemoration of their original discovery by Leeuwenhoek in 1675.

NEW YORK DEATH RATE FROM GRIP AND PNEUMONIA.—During the week just ended there was a large increase in the number of deaths reported from grip and pneumonia in New York City, as compared with the number reported from these causes last year. Thus there were 74 deaths from grip as compared with 5 in the corresponding week last year. Similarly there were 272 deaths from pneumonia, as compared with 140 last year. Estimating the number of cases from the number of deaths, probably not less than 2000 new cases of grip and pneumonia occurred in the city last week.

Evidently New York is in a state of siege from this disease, and it behooves the individual to be in a state of preparedness. Preparedness can best be obtained by following the advice recently given by the Department of Health, to avoid overcrowded and overheated places, to dress sufficiently warm when going outdoors, to keep away from those who cough and sneeze, to avoid alcohol, and to secure plenty of rest, and an abundance of fresh air.

The total number of deaths reported during the week was 1752, as compared with 1592 during the corresponding week of 1914, the respective rates being 15.91 and 14.87 per 1000 of population. The increase in the mortality during the past week was in the middle-age groups, the mortality under 1 year and under 5 years being considerably lower than during the corresponding year of 1914.

INCREASE IN COST OF DRUGS.—Report from Washington, D. C., on January 10, states that on account of continued rise in the cost of drugs,

particularly alkaloids and coal tar products, the United States Bureau of Mines, after investigation, will probably recommend to Congress that American wholesale druggists be encouraged in the manufacture of basic materials for synthetic drugs. The following table shows the comparative casts of some of the common drugs at present and a year ago.

Drug.	1915. Price.	1914. Price.
Quinine	\$1.25 oz.	\$.28
Calomel	2.35 lb.	.90
Bromides	5.00 to 6.00 lb.	.40
Carbolic acid.....	2.00 lb.	.18
Mercury	2.30 lb.	.80
Chloroform	1.10 lb.	.50
Cresolates	6.50 lb.	.60
Pernanganate potash..	2.30 lb.	.15
Glycerine	.70 lb.	.22
Paraldehyde	3.20 lb.	.80
Manna	1.25 lb.	.30
Senna	.40 lb.	.15
Castor oil	.18 lb.	.09
Phenolphthalein	10.00 lb.	2.50

SENDING AN ACKNOWLEDGMENT OF BIRTH CERTIFICATES TO PARENTS.—In January, the New York Department of Health inaugurated a practical and efficient method of reaching the public at large in so far as setting them to think of the importance of birth registration and the saving of infant life. Hereafter the receipt of the birth certificate in the Bureau of Records will be followed immediately by an acknowledgment of said birth to the parent in the form of a letter from the Commissioner of Health, a certificate showing the record of the birth, and educational literature giving an outline of the essential features of child care. Postal acknowledgment of all births reported by physicians, midwives and institutions will obtain as heretofore.

The letter from the commissioner, in addition to acknowledging the receipt of the report of the birth, urges the mother to keep the certificate because it will prove of great value during the life of the child, and may be used as a certificate for entering school or for obtaining an employment certificate at the legal working age of 14 years. Attention is also called to the fact that thousands of babies die unnecessarily each year, and the desire of the Department to give advice and information at the Infants' Milk Stations to all mothers who cannot afford to employ private physicians.

The certificate will be in the form of a card stating that a certificate of birth of an infant, bearing the given name, is on file at the office of the Department of Health. The certificate also gives the date and place of birth, and the name of the father and mother, and it bears the signature of the assistant registrar of the respective borough.

In this way an educational propaganda will be instituted and a large number of mothers will be informed of the ways and means in which the Department is ready and willing to assist them in the care of their infants, if they are unable to

pay for the services of a physician. It is also hoped in this way to reach a large number of native mothers, who have heretofore failed to come under any direct supervision of the Department of Health.

Inasmuch as the public will be advised through press notices to expect this acknowledgment of birth from the Department of Health, the importance of physicians, midwives and institutions recording all births without delay becomes evident.

TRACHOMA.—The National Committee for the Prevention of Blindness has issued a pamphlet entitled "Trachoma—A Menace to America," prepared by Mr. Gordon L. Berry, field secretary of the organization. This document is not offered primarily as a treatise on trachoma from the medical standpoint, but rather as a popular presentation of the subject for the education of the layman as to the prevalence of this disease, its effects upon vision and the methods adopted for its control and eradication. The use of technical terms has been avoided so far as possible in order that all phases of this important public health problem might be readily understood by the general public. Much of the information contained therein will prove of interest to the oculist, physician and surgeon, and the publication may be used in part or in its entirety by any one desirous of presenting the subject of trachoma through the medium of an illustrated lecture. Nearly one hundred lantern slides to illustrate the text have been prepared from photographs taken by the author or loaned by the United States Public Health Service, the United States Indian Service, et al. Copies of these slides may be purchased at cost from this committee, or will be loaned without charge other than transportation expenses. A copy of the publication will be sent free to any physician upon application to the National Committee for the Prevention of Blindness, 130 East 22nd Street, New York City.

EUROPEAN WAR NOTES.

WAR RELIEF FUNDS.—On January 15, the totals of the principal New England relief funds for the European War reached the following amounts:

Jewish Fund	\$2,381,743.00
Belgian Fund	87,902.95
American Ambulance Fund	71,616.55
Serbian Fund	61,627.19
Allied Fund	51,791.80
British Imperial Fund	43,312.40
French Wounded Fund	38,353.51
Armenian Fund	28,639.25
Surgical Dressings Fund	16,897.00
La Fayette Fund	16,179.99
Polish Fund	15,411.83
Italian Fund	14,723.55

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending January 15 there were 327 deaths reported, with a rate of 22.42 per 1000

population as compared with 235 and a rate of 16.37 for the corresponding week of last year.

There were 43 deaths under 1 year as compared with 26 last year, and 115 deaths over 60 years of age against 84 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria 39; scarlet fever 68, measles 50, typhoid fever 3, whooping cough 52, tuberculosis 60.

Included in the above were the following cases of non-residents: Diphtheria 5, scarlet fever 8, measles 1, whooping cough 2, tuberculosis 6.

Total deaths from these diseases were: Diphtheria 7, scarlet fever 2, measles 1, whooping cough 2, tuberculosis 22. Included in these were the following non-residents: Diphtheria 3, scarlet fever 1, tuberculosis 3, whooping cough 1. Deaths from influenza were 19, and pneumonia 73.

MASSACHUSETTS HOMEOPATHIC HOSPITAL MATERNITY BUILDING.—On January first the new maternity building of the Massachusetts Homeopathic Hospital was formally opened and dedicated. It is the gift of Wallace F. Robinson, who desired it to be a memorial to his wife, for whom it is named, the Jennie M. Robinson Memorial. The building is of limestone and brick, built fireproof throughout, and is planned to incorporate every device and appurtenance desirable in a modern hospital. There are provisions for seventy-five beds, including wards and private rooms. During the last calendar year there were 1162 obstetrical cases admitted to the Homeopathic Hospital, and from twenty to forty cases were refused every month for lack of accommodation. Although the new building may not be able to take care of all the cases presenting themselves, every opportunity is afforded for the most efficient care of admitted cases. The first and second floors of the building are used for out-patient purposes. Wards and private rooms occupy the upper floors, and a roof garden is built on top, with elevator service. A special room has been provided for twilight sleep cases. The dedicatory exercises were held in the entrance hall of the hospital. Dr. William Francis Honan, chief surgeon of the Metropolitan Hospital of New York made an address. Dr. Henry M. Pollock of the Norwich (Conn.) State Hospital is to be superintendent and Dr. Edwin R. Lewis, assistant superintendent.

EXPERIMENT IN OPEN-AIR SCHOOLROOMS.—Winchester, Mass., in September, 1914, began the experiment of an open-air schoolroom. A seventh grade class was installed in a room which, although it was not built for the purpose, was so altered that a full supply of fresh air could be admitted. The temperature was kept at about 45° F., and the work taken up was of the ordinary character. The clothing, which consisted of blanket coat and bloomers and lined canvas boots, was furnished by a local organiza-

tion, the Fortnightly. Admission to the class was on the request of the parents, and it was not intended primarily for sickly children. At the end of the four months comparative weights and measurements were made up with the pupils in another seventh grade class in the same building, who were in an ordinary room and who, presumably, were under the same general conditions of health, home and environment. The results are most interesting. The average gain in weight of the open-air class was 3.61, that of the other class, 1.69, a difference of 1.82 in favor of the former. In height, the open-air class gained .49 and the other class .24, a difference of .25. In the hemoglobin test the open-air class gained 4.55% and the other class lost 3.07%. A loss of percentage of blood corpuscles usually occurs during the school year, and the gain of the open-air class is of especial significance.

CHICKERING HOUSE FOR CONVALESCENTS.—The recently published annual report of Chickering House, Dedham, records a total number of patients cared for from October 1, 1914, to October 1, 1915, of 369. Dr. J. W. Pratt, visiting physician, states that a large percentage of the patients admitted have been either medically or surgically ill at their homes or at some hospital, and are received at the House for a period of convalescence. He further states that the services of a visiting physician seem to be required more during the first few days following the patients' admission than later, that they soon respond to the influence of their surroundings and benefit from the restful life, excellent hygienic and other wholesome conditions found at the Home. He considers this improvement in health of the patients so marked as to be of medical interest and importance.

NEW ENGLAND PEABODY HOME FOR CRIPPLED CHILDREN.—The report of the New England Peabody Home for Crippled Children for the years 1912 to 1914 shows a continuance of development and progress at much the same rate as in the past. The history of the institution has been a steady development from the time when it was housed in a small farmhouse at Weston until now, when it occupies a fairly well equipped modern building constructed for its use. The efficiency of the institution has increased in proportion to the improvement of its outward appearance. It has ceased to be a place where incurable and hopeless cases are sent to finish out their wretched lives, and has become an institution where cripples may go to be educated and helped, and perhaps cured. Expenses have inevitably increased correspondingly, and as the institution is wholly dependent upon voluntary subscriptions for its maintenance, gifts of money cannot be better placed where they will go farther to alleviate suffering and promote the usefulness of disabled children. One of the therapeutic agencies used in the care of

tuberculous children, and one which has produced most satisfactory results is heliotherapy. The introduction of heliotherapy has marked a distinct advance in the treatment of tuberculosis of the bones, which the Home was the first institution in Massachusetts to adopt. Of five children receiving full treatment, four have shown marked improvement. Others receiving partial treatment have made good progress. Further results in the use of this treatment will be of much value and much may be expected from it.

MILK AND BABY HYGIENE ASSOCIATION.—A preliminary statement issued by the Boston Milk and Baby Hygiene Association, shows that during the year 1915 it has cared for 4,800 babies at its twelve milk stations, as compared with 4,097 in 1914. But for the epidemic of acidosis and respiratory infections at the close of the year the total annual infant death rate would have been less than in 1914. As a result of this epidemic, however, the estimated infant mortality for 1915 will probably be between 104 and 105, as compared with 103 in 1914.

ESTABLISHMENT OF ANTI-TUBERCULOSIS SOCIETIES.—The Massachusetts Anti-Tuberculosis League has issued a statement signed by Allan J. McLaughlin, M.D., Commissioner of Health of Massachusetts; Arthur K. Stone, M.D., Chairman Trustees of Massachusetts Hospital for Consumptives; and Vincent Y. Bowditch, M.D., President Massachusetts Anti-Tuberculosis League, in which it endeavors to offset an impression prevalent, that because of the construction of tuberculosis hospitals and the maintenance of tuberculosis dispensaries there is no further need for anti-tuberculosis work. They state that active coöperation of anti-tuberculosis associations with state and local authorities is necessary, and will continue to be necessary, as long as tuberculosis exists. They urge the establishment in every community in the state of an organization of this kind, either as an independent body, or as a committee of some already existing organization that is interested in health or civic matters.

There are in this State some good laws which, if made effective, will help materially in reducing the ravages of tuberculosis. A representative organization, such as an anti-tuberculosis association, is in a position to see, not only that these laws are enforced, but also that sufficient appropriations are secured, without which it is difficult to do effective work, for the maintenance of local and state departments.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR DECEMBER, 1915.—There was a considerable increase in the total number of cases of communicable diseases reported to this Department during the month of December, 1915, as compared with the same month last year. This increase has been due almost en-

tirely to the increased prevalence of whooping cough and measles. The striking feature of the December mortality returns is the number of deaths from diphtheria, measles, typhoid fever and whooping cough.

Diphtheria seems to have been unusually virulent. During November, 1915, there were 1098 reported cases, with 65 deaths, while in December, 1915, there were 942 cases, with 80 deaths. This may be partly accounted for by incomplete reporting or failure to administer antitoxin early enough.

The fatality rate of measles during December was almost double that of November. In November there were 664 cases, with 5 deaths, while in December there were 1148 cases, with 16 deaths. This number of deaths again calls the attention of all health workers to the importance of measles as a dangerous disease. However, this number of deaths does not give any adequate indication of the amount of damage done by this infection.

With 136 reported cases of typhoid fever, there were 17 deaths during the month of December. This is an unusually high mortality for this disease.

Whooping cough accounted for 20 deaths during December. While the mortality from this disease was not as high as during November, it caused almost three times as many deaths as it did for the month of December, 1914.

The distribution of the increased prevalence of the various communicable diseases in the Commonwealth is of considerable interest. While the numerical increase of cases is due to the diseases named above, some of the other communicable diseases are of particular importance. Diphtheria, scarlet fever and typhoid fever were present in a number of cities and towns in unusual amounts.

Chicken-pox was reported in unusual numbers from the following cities and towns: Brockton, Brookline, Cambridge, Lancaster, Orleans, Pittsfield and Springfield. This is of particular interest to health officials only on account of its relation to smallpox.

Measles is markedly on the increase in various parts of the State. Some of the places in which it is present in the greatest amounts are as follows: Brookline, Chelsea, Lawrence, Lynn, Salem, Saugus, Winthrop and Webster.

Whooping cough is present in unusual numbers in the following cities and towns: Cambridge, Natick, New Bedford, Newton, Pittsfield and Somerville.

Scarlet fever is unusually prevalent in the following cities and towns: Arlington, Brookline, Cambridge, Lawrence, Leominster, Lowell, Lynn, Springfield and Winthrop.

While diphtheria has decreased somewhat in amount, it still remains important in many cities and towns. Among these are: Brookline, Cambridge, Fall River, Fitchburg, Haverhill, Lawrence, New Bedford, Newton, Orange, South-

bridge and Springfield. While in Lynn and Worcester it is still present in considerable numbers, it seems to be declining.

The only important focus of typhoid fever in the State is at Fall River.

During the month of December there was a sharp increase in the number of cases of typhoid fever reported from Fall River. Most of the cases were located in the south end of the city. An investigation into the source of the infection shows that almost all of these cases had received their milk supply from one collector, whose place of business is in Rhode Island. The Fall River Board of Health took prompt action and arranged to have this milk supply pasteurized under their supervision. The State District Health Officer reports that the situation is apparently under control.

During the month one case of amebic dysentery has been reported from Cambridge, one case of tetanus from Northampton, and one case of actinomycosis from Somerville.

Massachusetts Medical Society.

SUFFOLK DISTRICT MEDICAL SOCIETY, SURGICAL SECTION.—It is announced that the meeting of the Surgical Section of the Suffolk District Medical Society, previously scheduled for March 22, has been changed to Wednesday, March 8. At this meeting Dr. E. Starr Judd of Rochester, Minn., will present for discussion the subject of chronic cholecystitis. A complete program of this meeting will be published in a later issue of the JOURNAL.

Obituary.

JAMES CLARKE WHITE, M.D.

DR. JAMES CLARKE WHITE, who had been in failing health for nearly a year, died at his home in Boston, January 6, 1916, aged eighty-two years. The son of James Patterson White and Mary Ann (Clarke) White, he was born at Belfast, Me., July 7, 1833, and was graduated from Harvard College in 1853, in the class with Charles W. Eliot, James Mills Pierce, and Justin Winsor, and from the Harvard Medical School in 1856. During the next two years he was studying diseases of the skin at Vienna and elsewhere in Europe, and on his return to Boston he was made instructor in chemistry in the Harvard Summer School, being chemist to the Massachusetts General Hospital in 1863, and adjunct professor of chemistry in the Medical School from 1866 to 1871. In the latter year he

established in the Harvard Medical School the first professorship of dermatology in any medical school in the country, and occupied the professorial chair for thirty-one years. On his retirement in 1902 he was made professor emeritus.

Dr. White is remembered by a generation of medical students as a clear and convincing lecturer, and as one who handled his skin clinic at the Massachusetts General Hospital with consummate skill and precision. One can see him now, tall and commanding in presence, scrupulously neat in personal appearance, managing a wealth of dermatological material with rare ability, giving definite instructions to the patients, and, at the next clinic, making careful inquiries, for the benefit of the class, whether the instructions had been carried out.

Dr. White was the first president of the American Dermatological Association, was one of the incorporators of the Boston Medical Library Association in 1877, librarian of the Massachusetts Medical Society from 1864 to 1872, orator of this society in 1890, and president from 1892 to 1894.

Besides being physician to the department of skin diseases at the Massachusetts General Hospital from 1870 to 1903, he was a fellow of the American Academy of Arts and Sciences, member of the New York Dermatological Society, and president of the International Dermatological Congress in 1903, foreign honorary member of the Dermatological societies of London, Berlin, Vienna, and Italy, and corresponding member of similar organizations in France and Argentina. During the early years of his practice, from 1863 to 1867, he was editor of the BOSTON MEDICAL AND SURGICAL JOURNAL, and throughout his professional career many of his numerous articles, on dermatology for the most part, were published in the columns of this periodical. Two years ago he published "Sketches from My Life."

Dr. White was a member of the Somerset and Harvard Clubs, and of the Boston Society for Medical Improvement. His wife, who was Miss Martha Anna Ellis, of Boston, died in 1888. He is survived by two sons, one of them being Dr. Charles J. White, of Boston, and by eight grandchildren.

Correspondence.

EPISIOTOMY: AN AUTHOR'S REJOINDER.

Boston, Jan. 5, 1916.

Mr. Editor: In reply to a criticism of my views on episiotomy by "Obstetricus", published in the Correspondence column of the JOURNAL of Dec. 30, 1915, I should say that not alone "Obstetricus" but others who have spoken to me personally have apparently not understood my position with regard to episiotomy. I stated clearly in conclusion No. 3 in my paper that "It should not be performed except to prevent a complete tear, because incomplete perineal tears heal as

well as the episiotomy wound and are less difficult to suture."

Dr. Phillips, whose paper is criticized rather severely by Dr. Herbert Spencer in a letter to the *Lancet*, quoted at some length by "Obstetricians", advocated a much more extensive use of this procedure.

Dr. Spencer takes Dr. Phillips to task for stating that "Parvin was one of the earliest advocates of episiotomy in America," Dr. Spencer quoting an adverse opinion from the 1905 edition of Parvin's *Science and Art of Obstetrics*. In point of fact Parvin in 1882 (*Trans. Amer. Gyn. Soc.*, 1882, vii, 145), while not an over-enthusiastic advocate of episiotomy, criticized a statement by Playfair that tears of the perineum are always clean and linear in the following words: "Ragged rents of the perineum sometimes do occur and besides *episiotomy might save the sphincter*" (italics ours).

Dr. Spencer's slur upon Drs. Manton and Broomall as being "unknown to me as obstetrical authorities" is regrettable. In the case of Dr. Manton at least it displays his unfamiliarity with American obstetrical and gynecological literature.

I should agree with Dr. Munro Kerr that, sticking to my one indication, fortunately "it is an operation which is rarely required."

I must, however, take issue with Dr. Dakin's statement that "A tear made by the head, if properly sutured, heals most satisfactorily even when it extends into the rectum." I can recall a number of instances of complete lacerations of the perineum repaired by different obstetricians of ability which have failed to unite. Furthermore, after primary suture of a complete laceration of the perineum there not only is required the most exacting care to secure union, but the interference with proper regulation of the bowels and the necessary restriction of the diet disturb the puerperium and the patient greatly.

Finally, I should add that it is especially desirable to avoid complete perineal tears in patients who can not obtain skilled aftercare, as in out-patient clinics and patients attended by untrained nurses, and it is in these patients that episiotomy will be most frequently indicated.

Very truly yours,

JOHN T. WILLIAMS, M.D.

A RED CROSS SURGEON IN RUSSIA.

(From Our Special Correspondent.)

SARATOW, RUSSIA, Nov. 21, 1915.

Dec. 4.

Mr. Editor: To say that I was sorry to leave Budapest is expressing it too mildly, so I shall leave you to imagine my feelings on taking leave of the warm-hearted Hungarians and the hospital work that I had enjoyed so much. Doubtless you have heard of the decoration and honor bestowed on us for our services there; but even more precious to us were the good wishes of those who sent us to care for their compatriots and relatives held by the enemy.

Our journey to Russia was made very comfortably, taking in all only fourteen days, and of these we spent seven in Berlin and three in Stockholm. Reaching Petrograd on October 3, we remained there for ten days during which we saw much of the city. Thence we went to Moscow for a stay of sixteen days and thence southward to Saratow where I have been since October 29th.

The weather here is fine, cold and brisk, and for seeing this wonderful country this is the most desirable as well as the healthiest time of the year. Having struggled with the mastery of German and Hungarian, I am now endeavoring slowly to learn Russian, but it is not, to my ear, a flexible or musical language. The circumstances under which we work here are far from being the most comfortable, and the maintenance of cleanliness one of our most difficult problems.



American Red Cross Hospital at Budapest, Hungary.

I enclose for your interest a photograph of the Spital where we worked at Budapest. I am sorry that I could not write more of the work while at Budapest, but it was forbidden by the Washington authorities.

Saratow, where we are at present stationed, is on the Volga river, some distance north from Astrachan, which is at its mouth.

Very truly yours,

RICHARD METCALF, M.D.

AN EARLY MUSEUM SPECIMEN OF RUPTURED APPENDIX.

31 MASSACHUSETTS AVENUE,

BOSTON, Jan. 7, 1916.

Mr. Editor: In the catalogue of the Musée Dupuytren at Paris occurs the following note:

"Caecum—No. 450. Musée Dupuytren. In this specimen, the origin of which is unknown, one sees that there is a perforation of the tip of the vermiform appendix of the caecum, from which there has been an outpouring into the peritoneal cavity."

As Orfila had estimated that there were 1000 specimens in the Museum in 1842, it is impossible to judge, even approximately, of the actual age of the specimen, but in all probability it was placed there between 1835 and 1842.

Very truly yours,

WM. PEARCE COUES, M.D.

Miscellany.

NOTICE.

MASSACHUSETTS GENERAL HOSPITAL.—The Pay Consultation Clinic about which a preliminary notice was published in the JOURNAL on December 30, will open on Tuesday, January 25, 1916, at 2 P.M., in the Out-Patient Department Building on Fruit Street and continue each following Tuesday and Friday afternoon excepting holidays. A patient must reach the Clinic before 3 P.M. unless special arrangements are made in advance and must be accompanied by his physician or bring a letter from him. It is intended that the services of senior members of the hospital staff and chiefs of service will be available at these Clinics.

At the time of consultation advice as to the treatment will be given the physician, if he desires. The departments to be represented are:

Medicine.
Genito-Urinary Diseases.
Laryngology.
Diseases of the Eye.
Syphilis.
Neurology.

Surgery.
Orthopedics.
Diseases of the Ear.
Children's Diseases.
Dermatology.

SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-first meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, February 4, 1916, at 8.15 P.M.

The following papers will be read:

1. "Fractures of the Elbow in Children," with lantern slides. Dr. William E. Ladd, Boston.
2. "Physical Types—Dietary Control and Preventive Medicine." Dr. John Bryant, Boston.
3. "D'Espine's Sign in Childhood." Dr. John Lovett Morse, Boston.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*,
RICHARD M. SMITH, M.D., *Secretary*.

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, Jan. 25, at 8 P.M., sharp.

Business.

Communication: "Talks on Experiences with the Harvard Unit in France during the Summer of 1915," illustrated by stereopticon. Walter A. Lane, M.D., Orville F. Roger, Jr., M.D.

BRADFORD KENT, M.D., *Secretary*.

MASSACHUSETTS GENERAL HOSPITAL CLINICAL SOCIETY.—Meeting in Out-Patient Building Amphitheatre, 7.15 P.M., January 24, 1916.

1. Demonstration of Cases.
2. Hodgkins' Disease—Infectious Etiology
Dr. M. Smith-Petersen.
3. The Role of the Lymphocyte in Disease.
Dr. John J. Morton.

The visiting and administrative staffs, physicians, surgeons and students are cordially invited.

ELLIOTT C. CUTLER, M.D., *Secretary*.

CHILDREN'S HOSPITAL.—Clinical Meeting. The visiting staff of the Children's Hospital will hold a clinical meeting at the hospital, Friday, January 21, 1916, at 4.30 P.M. Physicians and students are invited.

HAROLD C. ERNST, M.D., *Chairman*.

THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES.—The Fourth Annual Session of the Federation of State Medical Boards of the United States, will be held at the Congress Hotel, Chicago, Monday, February 7, 1915, at which the following program will be presented:

1. Address of the President.—Dr. Charles H. Cook, President Massachusetts Board.
2. What the Federation Could Accomplish.—Dr. Otto W. Huffman, Long Island College Hospital, Brooklyn.
3. Regulation of Drugless Practitioners.—Dr. George H. Matson, Secretary Ohio State Board, Columbus.
4. Standardization of Hospitals.—Dr. J. M. Baldy, President Pennsylvania Bureau of Medical Education and Licensure, Philadelphia.
5. A National Examining Board.—General discussion.

This conference promises to bring together a large and representative attendance of the members of the Federation and physicians interested in maintaining high standards of medical licensure.

The Federation of Medical Boards of the United States.
WALTER L. BIERING, M.D., *Secretary*.

RECENT DEATHS.

DR. ISAAC OTT, a neurologist of note, died at his home in Easton, Penn., on December 31, at the age of 69 years. He was at one time president of the American Neurological Society, and dean of the Medico-Chirurgical College, Philadelphia, Penn.

DR. HENRY H. ATKINSON, for fourteen years a medical missionary at Harpoot, eastern Turkey, died at that place on Christmas Day of typhus fever. Dr. Atkinson was a graduate of Cooper Medical College, San Francisco, Cal. He leaves a widow and four children, all in Harpoot.

DR. JOSEPH CHASE, who died on January 10, at Vineyard Haven, Mass., was born in Boston on May 3, 1817. At an early age he became a sailor and at twenty-six retired a master mariner. He then studied dentistry and practised his profession in Boston for many years. Later he engaged in business. He is survived by three sons, one of them also a dentist.

DR. WILLIAM KELLEY FLETCHER died at the Somerville Home for the Aged, January 13, 1916, aged 87 years. He was a graduate of Dartmouth College in 1860 and of the Harvard Medical School in 1862. He was Act. Asst. Surgeon in the Army from May, 1862, to December, 1864. He had practiced medicine in Fitchburg and in Somerville, and was in the real estate business for 20 years. From 1863 to 1876 he was a Fellow of the Massachusetts Medical Society.

DR. EDWARD A. L. FRANÇOIS, who died on January 10 in Chelsea, Mass., was born at New Orleans, La., on October 9, 1836. He studied medicine and served as a surgeon on the United States ship *Ohio* in the Civil War. He is survived by his widow and by two daughters.

DR. HENRY C. HACHÉ, who died recently at Somerville, Mass., was born in Cape Breton in 1865. His parents migrated to Kentucky and he received his medical degree from the Kentucky School of Medicine at Louisville. He was a member of the American Medical Association, Massachusetts Medical Society and the Somerville Medical Society. He is survived by his widow and four daughters.

DR. FREDERICK D. SHEPARD died recently of typhus at Aintab, Turkey, where he had been working as a medical missionary since 1882. He was born at Ellenburg, N. Y., obtained his preparatory education at Cornell University and received the degree of M.D. from the University of Michigan. He was widely known in Asia Minor as a skillful surgeon and physician and a genuine and devoted friend to the people.

DR. JOSEPH H. TOWNSEND, who died of pneumonia on January 7 at New Haven, Conn., was born in 1862. He graduated from Yale in 1885 and had been a lecturer in the Yale Medical School. Since 1906 he had served as secretary of the Connecticut State Board of Health.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION FOR THE WEEK ENDING JAN. 8, 1916.

Contributions:—

Brooklyn Medical Society, Brooklyn, N. Y.	\$ 25.00
Receipts for the week ending Dec. 25	25.00
Dr. W. C. Cahall, Philadelphia	1.00
Dr. D. S. Lamb, Washington	5.00
Previously reported receipts	\$7,905.86

Total receipts	\$7,936.86
Total disbursements	\$7,310.04
Balance	\$ 626.82

F. F. SIMPSON, M.D., *Treasurer*,
7048 Jenkins Arcade Bldg.,

The Boston Medical and Surgical Journal

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Original Articles.

ORTHOPAEDIC WORK IN A WAR HOSPITAL.

BY ROBERT B. OSGOOD, M.D., BOSTON.

Orthopaedic Surgeon to the Harvard Medical School Unit, Serving at the American Ambulance in Paris During April, May and June, 1915.

THE following description of orthopaedic work in a war hospital is based upon a three-months' service at the American Ambulance in Paris as orthopaedic surgeon with the Harvard Medical School Unit. This Unit had charge of the so-called University Service of 190 beds during April, May, and June, 1915.

It was made possible by the generosity of Mr. William Lindsey and was organized by the Medical School with Robert B. Greenough as executive officer, and directed by him and Dr. Harvey Cushing, Mosely Professor of Surgery. No leadership could have been more happy. From start to finish the *esprit de corps* of the Unit steadily increased, thanks not only to the certain confidence in the surgical ability of the leaders, but also to a consideration on their part for the mental and physical comfort of those whom they directed, which engendered affection as well as respect.

The hospital is situated at Neuilly, just outside the city walls, in a large school building, the Lycée Pasteur (Fig. 1 Hosp.), which had been nearly finished but never occupied at the begin-

ning of the war, and had been offered by the French government to a group of physicians and surgeons connected with the beautiful little American hospital in Paris, who wished to be of service to the French people. The difficulties of organization and of financing the project and of the adaptation of this school building to the purposes of a modern hospital need not be dwelt upon here. The result as one sees it today is a most amazing tribute not only to the energy and wisdom of those who have made this possible, but also to the unselfish devotion of hundreds of men and women who have given their time, and the labor of their brains and their hands to this undertaking. This should not be forgotten and must always be a source of great satisfaction to the American people as an example of practical altruism and disinterested service.

The opportunity for work at the Ambulance leaves little to be desired. If one were building a hospital of six hundred beds one would not build it like a school house, but except for minor inconveniences, chiefly affecting the administration, the equipment and the nursing service are so good that poor work can find no excuse on these scores.

In the Harvard Unit service of three months in operations on clean cases there was not a single failure to obtain first intention healing. While this is surely a splendid record for the technic of the operating room carried out by Miss Cox, the head operating nurse of the Unit, and her assistants, it is also an evidence of the facilities which the hospital afforded for excellent work. The contrast which is offered by these opportunities and the more unsatisfactory condi-

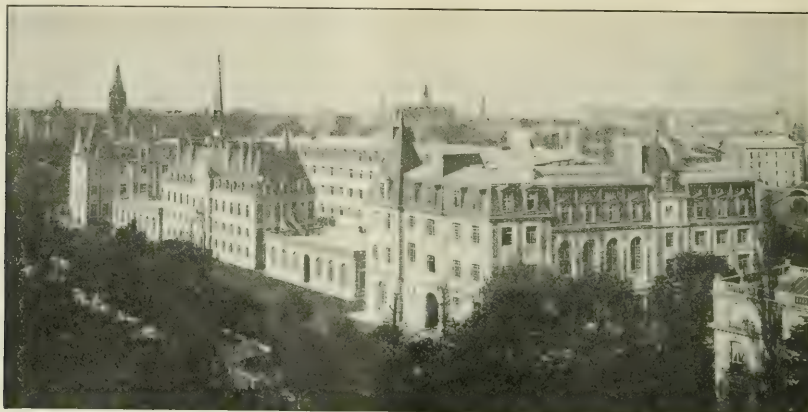


FIG. 1. American Ambulance. Formerly Lycée Pasteur.

tions necessarily existing in the temporary hospitals near the line was made very evident by the cases as they came in.

From an orthopaedic point of view perhaps the most important factor which made satisfactory work possible was the ability to keep the cases until their future treatment could be planned with some degree of wisdom, and such apparatus as was necessary could be obtained. These conditions are even better at present than they were during our service, since a convalescent home, where the treatment of cases can be continued and controlled has now been established.

The experience leads us to believe that in a war hospital the essentials for efficient orthopaedic work are:

1. A person interested in orthopaedic surgery, and in those mechanical principles which have to do with the fixation of inflamed joints and broken bones, and also with the restoration of function in stiffened joints and the obtaining of proper final alignment in fractures.

2. Proper materials with which the work may be done. (a) Dry, fine-ground plaster of Paris, and a medium meshed, starch-sized crinoline. Both these were obtained in Paris. (b) Simple shop and tools, a good vise, file, cold chisel, metal saw, breast drill, hammer, and tweezers, with small machine screws and tap, flat iron, perhaps 2 cm. wide and in at least two thicknesses, one 2-3 mm. and the other thinner, .5 to 1 mm.; iron wire of two sizes, .5 and 1 cm. in diameter, very thin stove pipe iron or sheet zinc. With this equipment one may make almost any form of metal brace, roughly to be sure, but none the less efficiently, and by painting with Japalac or covering with adhesive plaster or bandage it does not rust unpleasantly. We found in use at the Ambulance a form of glue applied directly to the skin and immediately covered with wide strips

of Canton flannel to which were sewed extension straps and a temporary gauze bandage applied. This Heusner's glue was most satisfactory and never caused the slightest irritation of the skin. It was removed with benzine, and seemed in every way superior to adhesive plaster. Its formula is as follows:

R	Resin	50
	Alcohol	50
	Benzine (pure)	25
	Venice turpentine	5
	Sig.	

Powder the resin, then add half the alcohol, the Venice turpentine, and benzine. Next wash out the measure with the remaining alcohol. Remove the glue with benzine.

A fracture table of some sort will be found of the greatest convenience, one may almost say a necessity. The Harvard Unit was supplied with the portable table designed by Dr. Robert Maddox of Cincinnati, and found it most satisfactory and equal to all the severe demands put upon it. Without going into too great detail, it consists of a series of hollow steel rods of different lengths, and steel clamps with holes to receive these rods bored at exact right angles. Various appliances, such as the steel bars of Goldthwait or the hammocks, can be fitted for the application of plaster jackets in recumbency, and an excellent extension table can be constructed on which, with the help of wooden stools, an operation may be performed. With the application of a soft leather stocking the most powerful form of lever or screw extension may be applied. At the end of the operation the patient is in a position for the application of a plaster spica while the extension is still maintained. It reminds one of the children's toy called mechano, so flexible and adaptable is it, its range being from absolute rigidity to a universal joint. One of the most useful features of it is the fact that it packs into

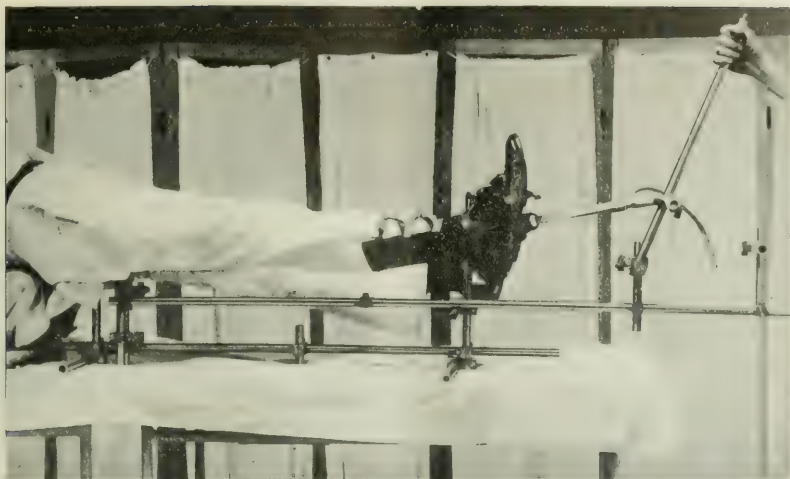


FIG. 2. Maddox table, with model in position for lever traction.

a case half as thick, half as wide, and about as long as an ordinary "dress suit" case. With the addition of a screw traction apparatus and a more generous pelvic support, it leaves in our opinion little to be desired for a working portable frame. (See Figs. 2 and 3).

3. Given interest and materials, one must have time and assistants to use them. We have seen several orthopaedic surgeons abroad "doing their bit" and doing it splendidly, but unable to do the kind of work which their training best fitted them to do and which in our opinion in this war is second in importance to none, because their time was fully occupied either with administrative matters or the routine surgery necessary on account of the septic nature of nearly all of the wounds or because they must do it alone.

At the American Ambulance all these necessary conditions were fulfilled. There was ample material to be obtained and an excellent blacksmith and carpenter who could be spared as

often as necessary for the actual labor of making copies of the apparatus devised. There was time to do this special work, thanks to the foresighted organization of the Harvard Unit, and there was the most ready help of the house surgeons and nurses constantly available. The work was made infinitely easier also by Miss Cassette, in charge of the apparatus, supplies and sewing. Much of the admirable apparatus in use at the Ambulance has been devised by her, sometimes acting on her own initiative and sometimes on the suggestions of the surgeons, but always with a keen appreciation of common sense mechanical principles. It was possible with her help to have apparatus and its fittings quickly and accurately made and to keep the necessary supplies on hand.

During the months of April, May, and June, about 450 cases were under the observation of the Harvard Unit, and of these between 20 and 25 per cent. presented some problem for the solution of which the help of the orthopaedic sur-

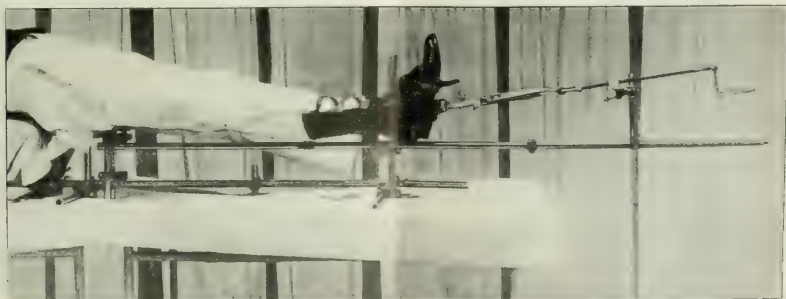


FIG. 3. Maddox table, with model in position for screw traction.

geon was sought. Touch with all the cases was kept by a combined visit with the surgeon to all the cases at least once a week and usually twice. The house surgeons were constantly on the watch for contracting tendons and muscles, and for joints which were in danger of becoming ankylosed or maintained in a position unfavorable for future function. Much after-treatment and deformity was undoubtedly spared by this attention. Careful records with a chronological, alphabetical, and diagnosis index were kept. It is hoped that the end results in these cases may be followed from information which has been obtained as to addresses of family and friends.

The cases with which the orthopaedic surgeon has to deal, group themselves into several classes:

- A. Simple fractures of the shafts of bones.
- B. Compound fractures of the shafts of the long bones, needing as perfect fixation as possible which would at the same time allow painless copious dressing or constant drainage.
- C. Injuries to joints, either from penetrating wounds, fractures into them, or external trauma.
- D. Ankylosis of joints, complete or partial, following immobilization or secondary inflammation.
- E. Contraction of tendons or muscles from faulty position or cicatrization.
- F. Nerve lesions resulting in paralysis and requiring apparatus.

Numerous other cases were seen in consultation with the heads of the other services, Dr. DuBouchet, Dr. Blake, and Dr. Mignot or their assistants, but unless followed are not included in this summary.

Let me take this opportunity to thank these heads of services for their great courtesy and consideration.



FIG. 4. First-aid splints of wire mesh.

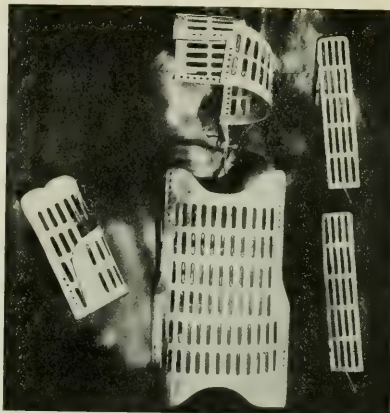


FIG. 5. First-aid splints of perforated metal.

At the front many ingenious and rapidly applicable splints are in use. They are made of wire netting (see Fig. 4), perforated metal (see Fig. 5), or thin aluminum and zinc cut into patterns which can be packed flat and quickly applied over bulky dressings (see Fig. 6). They are efficient, light and comfortable, and serve well for purposes of transportation, but must be removed for all dressings.

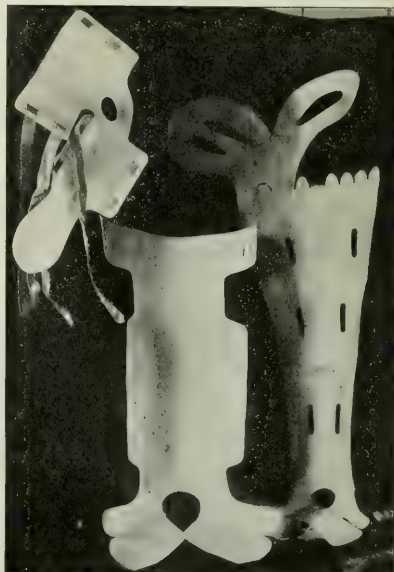


FIG. 6. First-aid splints of thin sheet aluminum or zinc. Packed flat and bent to required shape when applied.

A. SIMPLE FRACTURES.

The group of simple fractures is included, though their treatment was more surgical than orthopaedic. They represented an interesting group of 19 cases, and resulted from various injuries directly or indirectly connected with the war, such as the fall of timbers in a dugout as the result of a shell explosion, tumbling into a trench, or being thrown from a horse. One of these was a fracture of the pubic rami treated by recumbency and a pelvic belt.

There were three fractures of the humerus. One of these was a fracture of the surgical neck

comfortable. The apparatus was worn for four weeks and union at the end of that time was firm. As was seen from the x-ray, and is suggested in the photograph, not quite enough lift of the upper end of the lower fragment was maintained to secure a perfect anatomical result, although the patient could touch his elbow to his side, and the functional result should be good. The abduction splint later devised and described in this paper would, we believe, have been most satisfactory in this case.

There were five fractures of the tibia, two oblique, ununited with bad displacement, per-



FIG. 7. Plaster and wire apparatus with shoulder straps and pelvic iron piece inserted.

so near the head as to make advisable the treatment by abduction. A wire arm splint (see Fig. 7) was incorporated in a plaster swathe and supported by a bracket wire prop (A, B.) fastened to a piece of flat iron (F, D.) which was also incorporated in the swathe and extended below it, ending in a small padded cross piece (D.) exerting pressure between the ant. sup. spine and the trochanter and retained by a pelvic webbing strap (D, E.)

The usual discomfort of a plaster swathe which supports the weight of the arm was thus obviated, since by bending out the flat iron piece (B, D., Fig. 7) and increasing the pressure at (D.) a place where pressure is easily tolerated, pressure could be relieved on the ribs at (C.) a place where pressure is most un-

comfortable results being obtained by an operation performed by Dr. Greenough, and consisting of reduction and the application of a Parham band. One case of displacement and non-union in a transverse fracture, after six weeks reduced and retained by a bone plate applied by Dr. Vincent, and a fourth, transverse and fresh, reduced under an anaesthetic and retained satisfactorily in plaster.

There were four simple fractures of the femur, two in which union had begun before entrance to the Ambulance. One of these was in fair position and quite firm, the other badly outwardly bowed and soft, corrected and maintained by a plaster spica with the limb abducted. Two of the cases were old cases which were taken over by the Harvard Unit, and

represented large callous formation accompanying marked lateral displacement and overriding. These were both operated upon by Dr. Grenough and bone plated. It was a surprise and satisfaction to find that although in one case six weeks had elapsed since the displacement had occurred and there was an overriding of 5 or 6 cm., it was possible by the use of the Maddox table, combining the simultaneous possibility of adduction, abduction, and flexion, for manipulation, lever traction for force and screw traction for maintaining the amount gained and allowing the more gradual stretch of the soft parts, to secure almost perfect alignment and an end result of only 1 cm. of shortening, with firm union. The second case represented an overriding of about 4 cm.; but a lateral displacement of 5 cm. This was more difficult to overcome since it was many weeks after the fracture, and there was an enormous amount of new bone formation. It was accomplished at operation, however, by the skill of the operator and the use of the same adjustable forces, always more powerful than could be required or the patient would tolerate, but always under perfect control. Position was well maintained in a plaster spica for three weeks, but the last x-ray taken as a check before leaving showed that several of the screws had loosened and some anterior posterior displacement had recurred. It is probable, however, since little overriding exists, that at the removal of the plate a satisfactory position may be obtained and retained by a simple Buck's extension. Both operative wounds healed by first intention.

B. COMPOUND FRACTURES.

The second group comprises the compound and usually comminuted fractures. We shall not include in our consideration that large group of cases of compound comminuted fractures of the cranium or the jaws. The former received no orthopaedic attention and the mechanical problem of the latter are being wonderfully handled at the American Ambulance by the Dental Department under the direction of Dr. Hayes and Dr. Davenport. Too much cannot be said in praise of the efficiency of this department.

The compound fractures of the shafts of the long bones represented, however, the most interesting group of cases, since they presented problems which were to us new, and their solution seemed to be accomplished by somewhat unanticipated measures. They were practically all septic and this sepsis was in the majority of cases severe and accompanied by marked rise in temperature and constitutional reaction. There were 99 of these fractures, not including the compound fractures involving the bones of the hands and feet. For 33 of these, special apparatus of metal or plaster was devised.

General discussion of methods of treatment.

There are certain definite requirements:

I. The first and most important is fixation. (a) For the comfort of the patient and ease of dressing. (b) Because perfect fixation favors early union. (c) Because we believe that the danger of secondary haemorrhage is less when bone fragments are kept from moving.

II. The second is wide space for copious moist dressings and frequently for constant irrigations with hyperchlorite of soda solution 1-200.

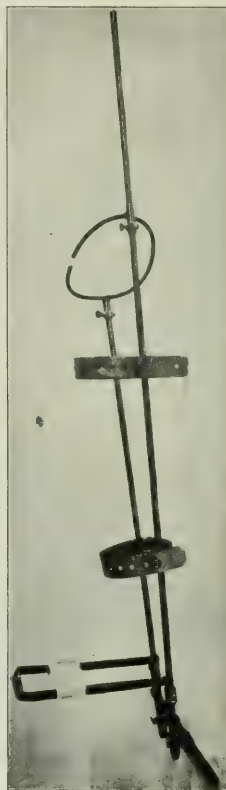


FIG. 8. Thomas splint made of Shelby tubing. All parts adjustable by thumb screws and removable. Note length of outside upright to immobilize hip joint.

III. It is a distinct advantage if the apparatus can be applied in more or less permanent form at the time the operation for drainage and cleaning is performed, this both to avoid the second anaesthetic for the sake of the patient and save time for the surgeon.

We came over supplied with an adjustable, quickly applied and fitted Thomas knee splint (see Fig. 8) with groin rings adjustable to any size thigh, right or left, with an adjustable cross bar to which extension could be applied.



FIG. 9. Adjustable Thomas splint applied. Thoracic outside extension retained in position by swathe.

The outside upright could be carried up along the side of the chest in order to fix the hip joint and maintain, if desired, an adduction or abduction. The uprights of these splints were made of Shelby tubing $\frac{1}{2}$ inch in diameter and $\frac{1}{16}$ inch thick. This could be easily bent by the use of levers. On these uprights ran ferules bearing thin metal straps which could easily be kept clean and made to escape the wounds. An adjustable foot piece maintained right angle dorsal flexion of the foot. The splint proved very use-

ful (see Fig. 9), occasionally as an immediate application at the time of operation, but more often as a later dressing when the wounds had partly healed. As an ambulatory splint, the adjustable cross bar being replaced by a block of wood, it was most satisfactory and much used both for knee cases and for thigh fractures in which union was not absolutely solid. (See Fig. 10.)

For fractures of the humerus we were equipped with light metal coaptation splints



FIG. 10. Adjustable Thomas splint with wooden foot piece for ambulatory treatment.

which, quickly rivetted to a light flat iron bar, furnished internal or external angular elbow splints, wrist, or hand splints.

As a matter of fact, we came to depend more and more on plaster-of-Paris for immediate dressings at the time of operation in all fractures except those of the humerus. This was in spite of the fact that we started with a distinct prejudice against this form of fixation in these severe, often septic fractures, and although those who had had wide experience had predicted that we should soon abandon this form of fixation. After the diagnosis had been made and while the operation for drainage and removal of bone fragments was still in progress, the necessary size and location of the openings in the plaster were planned. Bridges were then made of almost any kind of wire mesh, from fine chicken wire, to rolled-up screening, or from pieces of flat iron 2 cm. wide by 2-3 mm. thick. If flexible bridges with complicated curves were required, the wire mesh was chosen. If immediately rigid bridges were required or regular shapes could be used, then the flat iron was preferred. The materials were cut in the proper lengths, a plaster bandage was spread back and forth on the table a little longer than the metal, the layers being thoroughly rubbed in. This was then wrapped about the metal lengthwise and before it set bent into the shape previously determined upon, the soft projecting ends of the plaster being spread out into little fans for greater security of incorporation. When the operation was completed, as little padding as was safe was applied to the limb. About the wounds were wrapped sheets of oil silk. Over this, plaster was applied and after the first slight set the bridges, with small pads of felt under their ends, were incorporated and all the plaster about the wounds cut away, the oil silk being turned back on both sides as cuffs. The spans of these bridges were sometimes 25 to 30 cm. and in the



FIG. 12. Basket plaster in compound fracture of both bones of lower leg. Wound now granulating.



FIG. 11. Basket plaster in compound fracture of elbow.

lower leg these were often applied as runners, lifting the limb from the bed and allowing very easy dressing and constant irrigation (see Figs. 11, 12, 13, 14 and 15). As a routine these dressings were most satisfactory. They rarely had to be changed for two weeks, and then usually because they were too loose. The ample openings for drainage which the good judgment of the surgeons provided were sufficient to prevent in almost all cases an increase of swelling after the application of the plaster. Even in the badly comminuted thigh fractures the comfort of the patients was unexpectedly great, and both the time and the nerves of the house surgeons were conserved by them. We were always careful to arrange for the application of a tourniquet as a safeguard in the event of a secondary hemorrhage. In all cases where this seemed likely to occur, a tourniquet was kept constantly in place above or beneath the plaster. This experience is in keeping with that of Fayerweather, who has followed much the same methods at



FIG. 13. Plaster with anterior arch and posterior "runner" bridges of plaster-covered malleable iron for compound fracture of both bones of the lower leg. Applied by Dr. Eliot Cutler.

the American Red Cross Hospital at Pau, and with that of Prof. Tuffier in Paris. Prof. Lange is using plaster-of-Paris freely in Munich also. It takes longer perhaps for the original application than for some other forms of fixation.

but we believe the saving of time and labor in the dressings very much overbalances the increase in initial effort.

Fractures of the Humerus.

There were twenty-eight cases treated by the Harvard Unit, including joint involvements. When we arrived, the humerus fractures were being treated occasionally on the other services by extension in bed, the arm being supported on a special and very ingenious hammock frame devised by Dr. DuBouchet and Miss Cassette, and extension being accomplished by means of a weight running over a pulley spool attached to the back of a chair. For the most part on the University service they were being treated by sling and coaptation splints with the arm held at the side of the body. The results were hardly encouraging except in the extension cases in which the arm was abducted (see Fig. 16). This excellent apparatus was somewhat restraining, needed frequent adjustment, and kept the patients in bed when often they would, except for this, have been happier and healthier and have required less care if it had been possible to have them ambulatory. There were quite too many stiff shoulders and adherent subacromial bursae which accompanied treatment with the arm at the side, and the dressings were painful and immobilization imperfect. The results must be said to have been unsatisfactory. When other fractures or general condition required that the patient should be in bed, we had great satisfaction in the use of extension, and the wooden frame above referred to, in which was a hammock attached to trolleys running on two wire rods stretched the long way of the frame. In the cases requiring constant irrigation plus recumbency, we found that comfort could be attained by plaster-of-Paris dressings with wide windows bridged by spans of plaster, the arm being abducted on a pillow placed on a chair at the side of the bed.

Very soon we began to feel the need of some form of splint which could be worn, if necessary, in bed, but should fix the arm in abduction, should provide for traction, if necessary, should

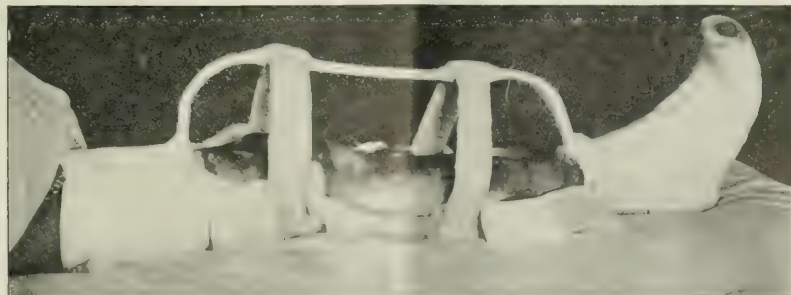


FIG. 14. Plaster with long arch and supporting rings attached to posterior bridge, for compound fracture of both bones of lower leg and multiple wounds of the anterior surface.

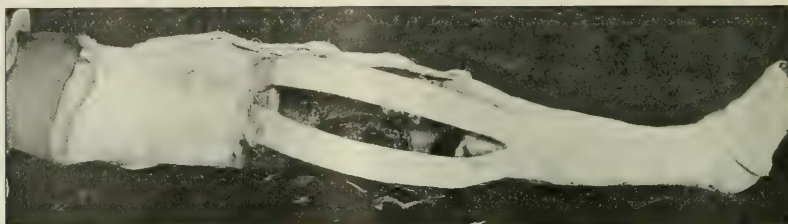


FIG. 15. Plaster applied under traction in a case of compound comminuted fracture of the femur, long bridges of wire mesh covered with plaster bandage affording generous space for dressing.



FIG. 16. Arm extension in abduction. Arm on pillow resting on board extending from bed to chair. Traction by weight over spool strung on wire fastened to chair back. Compound fracture of humerus.

permit dressings to be done with the least amount of pain, and should allow the patient to be ambulatory. Finally an abduction splint was worked out which seemed to meet these requirements fairly well. (See Fig. 17). A horizontal arm piece extends from the two flat iron uprights, AD and BE, connected on the side of the lesion by a light pelvic band, ACB, which exerts its pressure between the trochanter and the anterior superior spines. This arm piece is supported by two bracket pieces, AF and BG. There are free joints at D and E and between the uprights and the bracket pieces at A and B. AF and BG, by a series of holes bored in themselves and in the sides of the arm piece, are adjustable by means of thumb screws at various heights and positions, allowing full or partial abduction, and making it possible because of the free joints at D and E to drop the whole arm piece for dressings. The floor of the arm piece, made by winding with a bandage or adhesive plaster and cross braced with light iron in one or two places, gave increased rigidity. The horizontal arm piece was cut at F and G (see Fig. 17) and for the straight arm positions, when for example traction was desired, was fastened at these joints by a flat iron patch N, with two screws on either side of the cuts. When a right angle position of the elbow was desired, the outer end of the horizontal arm piece F I H G was turned on itself, F' taking the position of F, and G the position of G', and fastened in this position by right

angle patches O. The shoulder strap J and the pelvic strap M, which ran from A to B above the crest of the ilium on the side opposite the lesion, to B, kept the brace from slipping down, and the two thoracic straps L and K maintained the position of the brace laterally, the tightening of L relieving too much pressure at C. The strap K allowed extension to be put on the arm if desired, using the rigid end of the horizontal arm piece HI as a counter point. The straps were soft, broad, and well padded. Various adaptations and neater arrangements for the brace will at once occur to those mechanically inclined. These braces, however, can be easily and quickly and cheaply built with the simple tools and materials enumerated above. Made of soft iron and on the dimensions given in the figure they were adjustable to any individual, and could be used on the right or left side, with either straight arm and traction (see Fig. 18) or with the elbow bent at a right angle (see Fig. 19). Two of the patients who needed constant fixation or traction slept comfortably in them. In the other cases they were worn during the day only, in order to maintain abduction and preserve motion in the shoulder joint and prevent adhesions in the subdeltoid bursa. We believe that in fracture of the upper half of the humerus and in severe wounds of the upper arm some form of brace which maintains abduction and allows ambulation will be found useful.

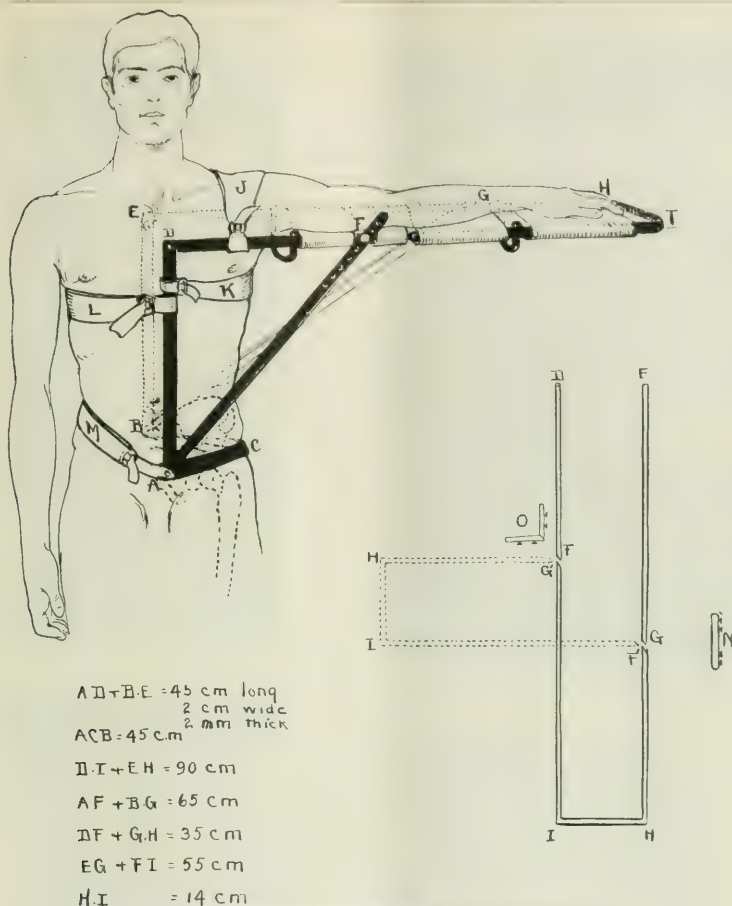


FIG. 17. Outline drawing of abduction splint for arm. See text, page 118.

Compound Fractures of the Forearm; 14 Cases.

For the most part these somewhat rare injuries were easy to immobilize by plaster with bridges or by simple side splints, and presented no peculiar problems. In many cases the loss of substance of one or the other of the bones was so considerable as to necessitate a bone graft in the future, but on the university service no completely healed case occurred where this could be attempted with any likelihood of success.

Compound Fracture of the Femur; 17 Cases.

It was in these cases that we had expected to use quite generally the adjustable Thomas knee splint with chest extension upright. As a matter of fact we used this in only four acute cases. In several of the early bad compound and septic thigh fractures the wounds were so high up, both

anterior and posterior, that the groin ring would have interfered with the dressing. These cases with the help of the Maddox table were immediately placed in large plaster spicas, while traction was exerted and maintained till the plaster had set. The patients were most comfortable and could be moved with scarcely any pain. The large bridges allowed ample space for dressings and the cases did remarkably well. This became the treatment of choice in the severe open wound cases, lighter spicas with smaller bridges or simple windows or the adjustable splints being applied later as soon as conditions allowed.

I do not know who first used the webbing ankle strap method of extension, but we first saw it employed by Prof. Delbet at the Necker Hospital in Paris. While the exploratory operation was being performed two straps of soft webbing were fitted to the skin of the ankle; the one over

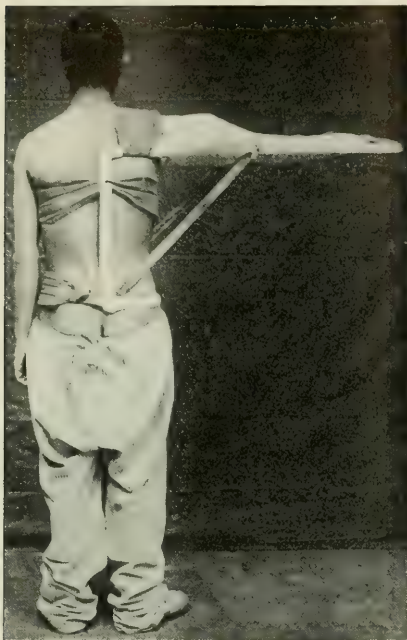


FIG. 18. Abduction splint applied. Arm extended with traction.



FIG. 19. Abduction splint applied. Elbow flexed at right angle.

the tendo Achillis, behind, and the other over the dorsum of the foot, in front. These were then sewed to each other on each side over the two malleoli, to the ends of a loop of webbing. This loop with a spreader inserted was used for traction. The plaster, when strong traction was necessary, was applied without fear over these webbing straps, including the foot. When the plaster had set, a linear cut was made in the plaster behind, and the strap was found and cut. A second window over the dorsum of the foot allowed access to the front of the strap and cutting off the ends of the traction loop, the whole strap could be pulled out through the anterior window. As far as we are aware we had no pressure sores from these traction straps.

Prof. Delbet is using a most ingenious and, in his hands, satisfactory open apparatus for fractured thighs (Fig. 20), gaining his fixation and traction by means of a groin ring and three metal extension rods working on powerful springs, having their counter point of extension in a plaster cuff moulded directly over the skin into the sulcus just above the femoral condyles. Lately, because of an occasional slough, he has been continuing plaster splints downward to make the pressure over the condyles less. He expresses himself as entirely satisfied with the results of this method.

We saw several cases in which plaster bandages in the form of flat splints, had been ap-

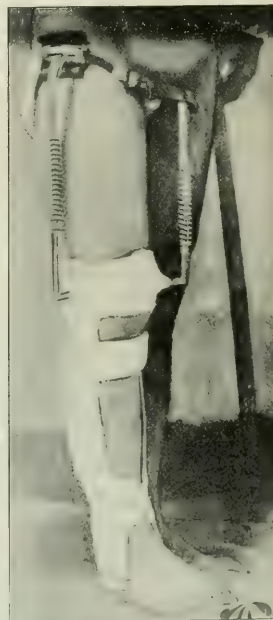


FIG. 20. Apparatus used by Prof. Delbet for fractures of the femur.

plied at the front, next the skin, on fractures of the femur and lower limb. The apposition was excellent, the fixation good, and there were no abrasions. The method would seem to have advantages and to be more often applicable, as a first-aid fixation.

Compound Fractures of the Lower Leg; 28 Cases.

The wounds in these cases were generally severe and required through and through drainage and frequently for several days constant irrigation. A plan of making the posterior bridges into runners on which the leg might rest and so be lifted from contact with the bed and an arch over the anterior surface by which the limb might be lifted and from which the free portion could be supported if it tended to sag, was early adopted and proved satisfactory. (See Fig. 13.) Sometimes when the wounds were anterior or lateral, a narrow re-inforced plaster splint could be applied to the back of the leg and made rigid by an arch and horizontal rings. (See Fig. 14.) It was necessary to exercise great care in padding over the heel and dorsum of the foot and to see that the edges of the plaster on either side of the open space did not cut into the portion of the leg which occasionally tended to sag between them. With care this was avoided by supporting from the anterior bridges. One case whose tissues were of very low vitality and whose leg later had to be amputated because of extension to both the knee and ankle, had several small abrasions at these edges. Since returning we have learned of the development of an abscess

at the knee, beneath a plaster spica, apparently not from pressure, however.

On Dr. Blake's service a method of overhead traction was in use and was apparently proving very satisfactory. Light wooden frames similar to that shown in Fig. 21, were erected over the bed and the arm fractures were suspended by a combination of weights and pulleys maintaining proper lines of traction and allowing easy dressings and quite free motion of the patients through the shoulder joint. The lower leg fractures were fixed in metal splints such as the Blake's modified Thomas splint, and suspended also with the same advantages. The method has much to recommend it, but we felt that the more complete fixation of the casts and the ambulation allowed in the arm cases were advantages to be retained as long as we could gain an equal degree of comfort for the patients and the cases progressed as steadily as it seemed reasonable to expect.

C. COMPOUND INJURIES TO JOINTS EITHER FROM PENETRATING WOUNDS, FRACTURES INTO THEM, OR EXTERNAL TRAUMA.

The treatment of these injuries as a class, we believe, should be most conservative in most cases. If there were any way in which one could at the initial operation determine the extent of the septic process or predict the exact amount of reparative power of the traumatized bone, much time might be saved the patient by a radical operation. We have been impressed, however, with the unexpected, and we may say atypical,

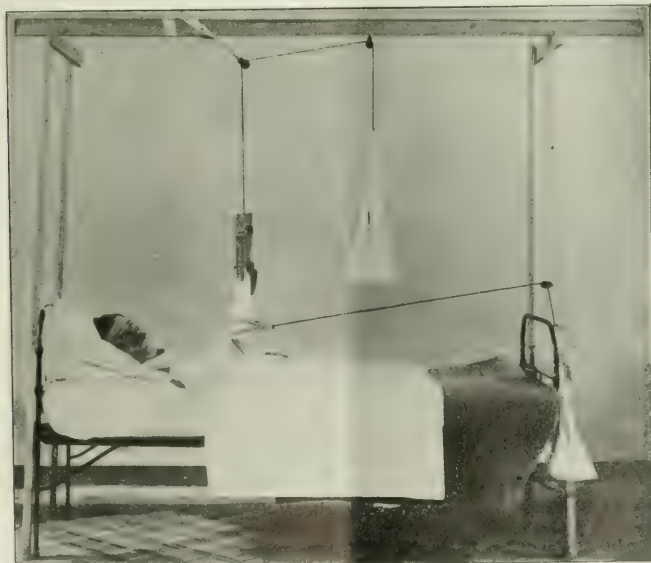


FIG. 21. Overhead frame for suspension and traction in fractures. (Service of Dr. Joseph Blake.)

power of repair which many of these cases showed. This was demonstrated in the x-rays of certain of the chronic cases, taken when the Unit took charge, and compared with the x-ray plates taken before. For example, a shoulder joint much disorganized and originally markedly septic practically excised itself, separated the head, rounded off the upper end of the lower fragment and covered it with fibrous tissue so that an operation for excision amounted practically to removing a sequesterum.

A septic compound fracture of the patella with involvement of the knee joint under complete fixation and careful dressings, gradually improved, but since there seemed little likelihood of the fragments uniting, it was planned to remove the fragments and the sequestra in order to promote healing. A subsequent x-ray taken as a precaution before doing this, showed distinct evidence of bone regeneration between the fragments, and before we left there was complete union, all sinuses had been closed for over two weeks, and there was slight movement of the patella.

It is evident that in these two cases at least Nature had performed a far more skilful operation than man could have hoped to have accomplished, and had attained a result more permanent and more advantageous. We are aware of no way of determining at operation by macroscopic appearances the extent of the power of the osteogenetic bone. We are convinced that our conceptions of bone repair must be modified and that there is danger of too little rather than too great conservatism in the treatment of these low-grade septic osteomyelitic cases.

There were four excisions of the shoulder and two excisions of the hip performed by surgeons of the Harvard Unit, but only after prolonged observation and the belief that clear line of demarcation had been formed between living and dead bone. In certain of the cases, however, it was far less easy at operation to determine this than the x-ray suggested it would be. It is our personal opinion that at least an equally good result and as speedy a healing, with perhaps a greater possibility of attaining ultimately better function, might have followed a still longer delayed operation. The function of the shoulder which, with a little help excised itself, was better than that of any other excision.

Where there were severe joint injuries accompanied by spasm, extension seemed to give great relief. This was especially true of the shoulder, the hip, and the wrist. In the wrist joint the tendency to crowding together of the mass of bones was very marked, and by applying a plaster to the flexed elbow and incorporating a frame of flat iron, extending out beyond the ends of the fingers, a satisfactory extension in addition to fairly complete fixation was attained. In these cases there was no question of conserving eventual joint motion. The problem was rather

one of free drainage and the avoidance of septic absorption from the joint surfaces.

Perforating Injuries to Joints Requiring Drainage.

There were several cases in which there were small openings into joints accompanying deep and extensive wounds of the tissues in the neighborhood; one of the elbow, three of the knee, two of the ankle. In all of these the policy of inserting only a very small rubber tissue drain was followed. The joint was then carefully watched, but in none were more extensive incisions necessary. The rubber tissue wicks were soon removed and the function of the joint was undoubtedly more conserved by the small opening and slight non-irritating drainage of short duration than if this watchful conservatism had not been practised.

One of these cases deserves special reporting. A man had received a perforating wound of his left tibia and a small abrasion of the left knee near his patella. The tibial wound had been explored and drained by a previous service. The knee wound was healed, though the joint was swollen and flexed. An x-ray showed that what was supposed to have been a simple abrasion of the knee was in reality a wound of entrance of a piece of shell which had penetrated the joint and was now imbedded in the inner femoral condyle and surrounded by an area of greater radiability. Dr. Cushing with his cranial burr tunneled the condyle without apparently opening the joint, found the cavity and a small amount of pus, and removed the foreign body. A culture showed a pure growth of gas-producing bacilli and the next day the joint swelling increased and gas crepitation could be felt in the neighborhood. With fixation, however, the joint quieted down, the wound healed, and muscle spasm disappeared. The capsule was still thickened and the joint was much relaxed when we left, two months later, but there were no acute symptoms, motion was good, and the patient could bear weight without pain, wearing a plaster cast. The fact that gas-producing bacilli can remain inactive in a bone cavity for at least six weeks and the benign character of the secondary infection in this case are interesting.

On the other hand, if severe joint infection occurs, we believe it is still as much of an axiom as ever that free drainage quite without regard to future function must be obtained. In the hip joint our experience would lead us to believe that eventually excision in these cases will be probably necessary (3 cases). In one case of severe compound fracture of the lower end of the femur in which the knee joint was involved, it was very largely the absorption from this surface which finally made amputation necessary as a life-saving measure.

Fractures into Joints.

All of these were compound except one or two simple ankle fractures. The majority were into

the shoulder joint. There was only one true intra-capsular hip fracture and about an equal division between knees and wrists, elbows and ankles. They were all treated by free incision when the septic condition at entrance seemed to demand this, and by the same kinds of fixation as the compound fractures of the shafts. These cases may be expected to have completely or partly ankylosed joints or to come to eventual excision by Nature or by art. Whenever possible, quiescent joints and even slightly threatening compound joints were simply fixed, and the judgment seems to have been wise.

Joint Injuries from Trauma without Wounds.

These comprised four knees and three ankles, two old simple fractures of the malleoli and one a sprain of the external lateral ligament. These needed only adhesive-plaster strapping.

The knees were most interesting. Two represented simple wrenches with strain of the lateral ligaments and effusions subsiding under fixation in a plaster cast, the x-rays being entirely negative. In two we were unable, in spite of good x-ray plates and careful physical examinations, to make a definite diagnosis, but we believe one represented almost certainly one of those injuries to the cartilage of the femoral condyles resulting from a localized blow which, with a small area of bone necrosis beneath, represented, perhaps, an incipient osteochondritis dessicans. The other was either a similar lesion or the dislocation of a semilunar cartilage which had slipped back into place. Both these cases, although they had slight effusions, pain, and disability on entrance, were soon able to walk, without pain, in bivalved plaster casts, and it did not seem fair in a service in which there were so many septic cases to widely explore such useful knee joints by a vertical incision through the patella, which in our opinion would have been in these cases the only satisfactory method of exploration.

D. ANKYLOSIS OF JOINTS, COMPLETE OR PARTIAL, FOLLOWING IMMOBILIZATION OR SECONDARY INFLAMMATION.

These problems were of chief orthopaedic concern, and while attention was paid to all the joints which it was necessary to immobilize in connection with fractures of the shafts, some nine shoulders, six elbows, four knees, and two wrists received special attention. There is an excellent massage department connected with the American Ambulance to which M. Floron gives his services as director. The hospital badly needed a small medico-mechanical department which we are glad to report has since been established at the convalescent home at St. Cloud. There have been installed French machines which, by ingenious attachments, make use of a single pendulum or wheel for gentle passive or active mobilization of all the different joints.

As soon as the wounds would allow, massage and gentle passive motion were begun in all cases in which motion was limited.

Shoulders.

By the use of an abduction splint (see Fig. 19) for a part of the day the tendency to adhesion in the subacromial bursa was overcome. For purposes of economy one patient wore the splint one-half of the day and another patient the same splint the other half of the day. It seemed possible when the cases were under control from the start to conserve motion in all cases where there was not a bony lesion of the joint proper. The splint was especially useful following excisions.

We question somewhat whether for the ordinary farm laborer or artisan an excised shoulder is to be preferred to a completely ankylosed shoulder fixed in a position of slight abduction. Such statistics as are available of the end results of excision of the head of the humerus for various causes in civil life are not altogether encouraging. Disease, *e.g.* tuberculosis, is often satisfactorily controlled, and passive motion through a considerable arc is usually possible, but there is frequently little active motion, and this of a weak character. The somewhat flail nature of the joint prevents its moving with the scapula, since the muscles which fix the head to the glenoid no longer act on the bone. For cosmetic purposes this even imperfectly controlled motion is obviously an advantage, but for laboring purposes we believe it may not be an asset.

In several of the incompletely healed cases in which ankylosis was to be expected a padded wedge whose angle could be widened was inserted in the axilla and gradually an increased amount of abduction obtained either by the yielding of the joint itself or by the stretching of the scapula muscles.

Elbows.

There were three elbow joints in which not only was motion limited, but in which that limitation allowed less than right angle flexion. In one case, not treated originally by the Unit, a healing elbow fracture had been allowed to become quite stiff at an angle more obtuse than a right angle and was quite rigid even under as great force as seemed wise to apply under an anesthetic. When a sufficient time after the septic process has elapsed, an open operation will be necessary either to gain motion or a functionally better position of ankylosis. This position might have been obtained in the course of healing with a modicum of foresight. In two other cases of fracture, by very gentle and incomplete manipulation, under an anesthetic and most gentle but continuous after-treatment, motion to less than a right angle was gained, and the patients could put their fingers to their mouths. We believe much harm may be done by too forceful and complete mobilization of these joints un-

der an anesthetic. *Brisement forcé* is at best a crude method of breaking up adhesions and stretching tendons and capsule and ligaments. An inflammatory reaction from it leaves such a joint stiffer than it was originally. To illustrate, an incompletely healed hip joint with a discharging sinus in marked flexion and adduction, and a shoulder joint in which the inflammatory process threatened to subside with the shoulder left stiff without abduction, were gently, very gently, manipulated under an anesthetic in order to secure a functionally better position in which anticipated ankylosis might occur. In both these a very marked febrile reaction, 104-105° F., followed the manipulation and was accompanied by constitutional disturbance and an increased suppuration. The object was gained, but the risk was not inconsiderable, and its degree somewhat unanticipated. The pound of cure was a very heavy one. The ounce of prevention would have been light.

Wrists.

The two wrists followed prolonged immobilization without local wounds. They were both in permanent plantar flexion with apparent loss of power in the extensors and very slight passive motion in the direction of further plantar flexion. For these, continuous and lifting elastic traction was applied by means of a complete or removable cast including the elbow. To an ordinary glove (suggested by Miss Cassette) was at-

tached a webbing strap with strong elastic inserted. This strap ran over a wire bridge incorporated in the plaster and could be tightened by means of a buckle in the plaster above (see Fig. 22). Motion and a return of power in extension following the use of this simple appliance.

Knees.

One of the knees regained the desired hyperextension by massage. In one in which, following a wound of the hamstrings, there was an obstinate muscle spasm, fixation in a cast was followed by a return of painless motion. One knee represented an infectious arthritis following a wound elsewhere and accompanied by an endocarditis and a high temperature. There was marked effusion, a boggy capsule, and a flexed position. The knee quieted down and the flexion was overcome by a series of plasters. Motion was still limited, but increasing, when we left, under gentle manipulations, massage and hot baths. The fourth knee was permanently flexed 30° and very sensitive following a wound of the hamstrings. There was a true contraction of the muscles due to cicatrization. In this case full extension was gained in ten days by the use of the iron extension hinges described by Dr. W. H. Turner of Montreal (see Fig. 23). These irons are incorporated in a plaster which is cut away generously over the knee in front, and divided by a linear cut beneath the knee. It is obvious that when the thumb screw at B, travelling on the



FIG. 22. Apparatus for continuous lifting traction in partial ankylosis of the wrist. Musculo-spiral weakness.

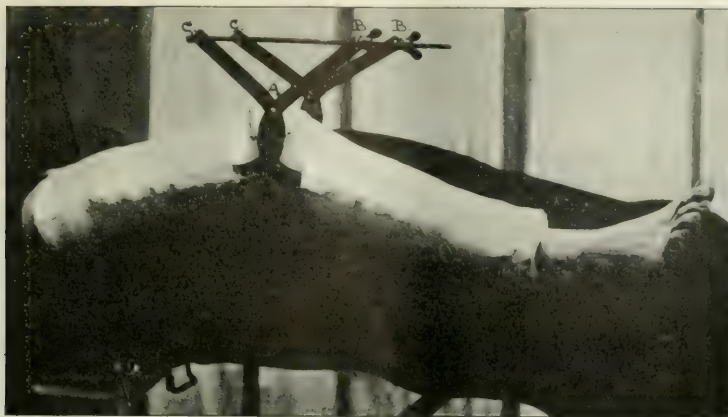


FIG. 23. Turner's extension apparatus for flexion of the knee. See text, page 124.

threaded rod between B and C is made to approach C, the leg must extend. Because of the centering of the joint of the brace at A, above the centre of the knee joint, a distracting force is exerted as well, which overcomes any tendency to subluxation.

Many of the completely or nearly completely ankylosed joints following direct injury or adhesions following septic processes, will undoubtedly furnish before many more months wonderful possibilities for mobilizing operations of some sort. In the cases under our observation the septic process was of too recent existence to make it wise to consider such operations at this time, but we believe this will be one of the most interesting fields for post-bellum orthopaedic surgery.

E. CONTRACTION OF TENDONS AND MUSCLES FROM FAULTY POSITION OR CICATRIZATION.

There were about fifty wounds of muscle tissue which entered the hospital during the time of service of the Unit, in which it was important to watch for possible contraction as the healing process progressed. At the beginning of the service we saw many cases in which there was considerable muscular spasm, and in several, actual contraction accompanying the healing of muscle wounds. In 17 of the 50 wounds some apparatus, either plaster (12) or apparatus of some sort was applied as a preventive measure. In one case of equino varus following a haematomyelia, due to a wound of the spine, a lengthening of the tendo Achillis was done after a manipulation under an anesthetic. A "varus" brace was applied later.

We have spoken of the use of the Turner extension irons in case of contraction of the hamstrings in the previous section and of the elastic lifting traction for the wrist in cases of contraction of the flexor tendons of the wrist. The

threatened or actual contraction of the calf muscles with limitation in dorsal flexion of the foot, often presented special problems because of the presence of multiple wounds. A wire splint, which was attached to the leg by straps across the dorsum of the foot and near the knee only was very satisfactory. Ambulation was possible because there was only a soft band across the ball of the foot (see Figs. 24 and 25). By tightening padded ankle strap, A, the upper part of the brace springs away from the leg. By then tightening upper strap, B, the foot is dorsally flexed, using A as a fulcrum. A considerable



FIG. 24. Line drawing of wire splint to correct foot drop.

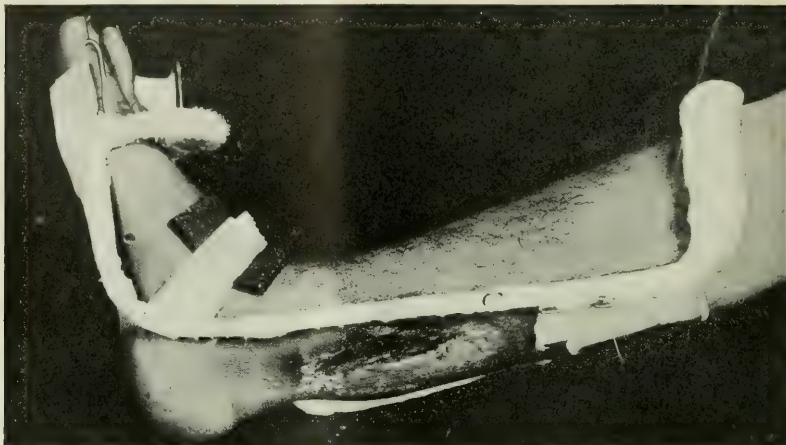


FIG. 25. Wire foot drop splint applied

degree of tension can be secured by its use, though one must exercise care lest with the amount of leverage force at one's disposal, too great pressure be exerted over the dorsum of the foot at the bend of the ankle. The strap here should run over a very thick pad. Repeated plaster casts and an occasional manipulation under an anesthetic followed by retention in the corrected position were sufficient to overcome other contractures.

We were impressed by the necessity of watching most carefully these cicatrizing muscle wounds. Contraction and spasm often came on very quickly, and if not speedily treated, became obstinate and crippling. With preventive apparatus these contractures may be easily avoided.

F. NERVE LESIONS RESULTING IN PARALYSIS AND REQUIRING APPARATUS.

There were many nerve lesions resulting in paralysis, the most common of which were lesions of the musculo-spiral, followed by complete or partial wrist drop and lesions of the external popliteal or peroneal nerve resulting in foot drop. These lesions are mentioned in this survey of orthopaedic work since apparatus was frequently used to retain proper position and prevent subsequent contraction of the active antagonizing group of muscles. Where there is an incomplete division of the nerve or only temporary loss of conductivity, function returns in the paralyzed group much more quickly if the tension is taken off the more powerfully enervated antagonists. This, of course, has been proven to be true many times in cases of poliomyelitis. For the wrists a simple "cock up" splint, simi-

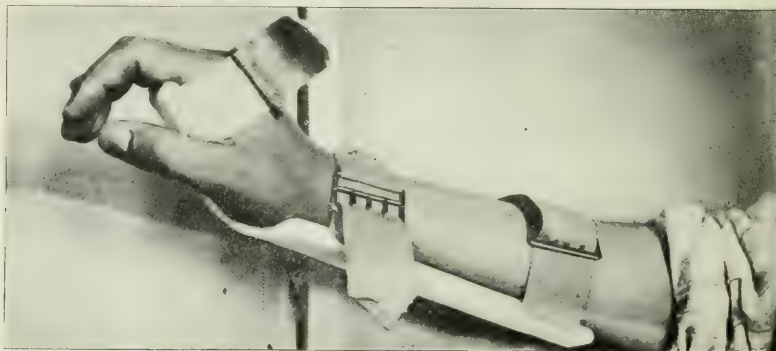


FIG. 26. "Cock up" wrist splint applied.

lar to that employed by Mr. Robert Jones of Liverpool, was made from flat iron, rivetted to a palmar pad and a forearm gutter of sheet zinc, it being possible to bend the iron between the zinc pieces and retain any degree of dorsal flexion desired. This splint came to be rather generally used throughout the hospital (see Fig. 26). For the foot drop the anterior wire splint described in the previous section (see Fig. 25) was used for all active and some recumbent cases and plaster half shells holding the foot at right angles in others.

We confess to some doubt at the beginning, as to whether an orthopaedic service at a war hospital would prove interesting to the orthopaedic surgeons or be useful to the other departments of the hospital. The doubt as to the interest of the orthopaedic problems presented disappeared at once and the work assigned to the orthopaedic surgeon, seemed to answer the other question.

In connection with the Ambulance a convalescent home where the ambulatory cases may be watched and controlled and where massage, and mechano-therapy, can be had, is now established and adds greatly to the value of the orthopaedic work.

No service could have been more pleasant or profitable. The attitude of the heads of the permanent services was most cordial. The university division, of which the orthopaedic service was a part, represented one of the best examples of "team play" we have ever seen, thanks to the organizer, Dr. Greenough. The regular general visits with the surgeons, I am sure, should be a requirement in every general hospital which has an orthopaedic service, quite as much for the sake of the orthopaedic surgeon as for the special help he may be able to give. Assistance and co-operation were constant, and the work could not have been done under more favorable conditions. It seems to us most desirable that American orthopaedic surgery should accept this opportunity for service, which the unfortunate war has made necessary.

SOME ANTHROPOLOGICAL COMMENTS UPON THE SO-CALLED "HERBIVOROUS" AND "CARNIVOROUS" TYPES OF MAN.

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WITHIN the past year the BOSTON MEDICAL AND SURGICAL JOURNAL has devoted considerable space to articles and editorials on physical types of man and the relation of these types to disease, eugenics, civilization and what not. From the medical standpoint it would doubtless be most advantageous if it were possible

to divide the whole of mankind into "carnivorous", "herbivorous",* and omnivorous types, each of a distinctive anatomical, physiological and psychological conformation. It would then be possible to classify a patient by a casual inspection of his complexion, stature, and girth, thence to proceed to a diagnosis of his case by a simple method of elimination.

Granted that there are tall men and short men, lean men and fat men, and that if we divide mankind on the basis of these two dimensions it will be found that the short, fat men are more liable to apoplexy and the tall, lanky men to pulmonary diseases. It is very far from the purpose of the anthropologist to cavil at any new classification of man which may be of use to medical science, but there are very grave anthropological objections to an arbitrary classification of man based on one or two anatomical characters, when that classification disregards racial differences, heredity, changes due to adolescence and old age, and the entire zoological background of man's ancestry.

In order to establish an anthropological type it is necessary to combine the results of extensive morphological observations with measurements on long series of subjects. The evidence of the existence of such a type must then be presented in concrete statistical form, and if possible, a mathematical correlation between the associated characters demonstrated.

Neither Dr. Bryant in his articles on the "Carnivorous" and "Herbivorous" Types in Man, nor Dr. Goldthwait in his Shattuck lecture on a similar theme has pursued this biometric method. Dr. Bryant offers no statistics proving a correlation between short intestines, high stature, and bodily thinness. There exist, so far as I know, no anthropometric data that furnish ground for the broad assumption that tall men are lanky and short men are fat. Anthropologists express the relation between stature and weight by the index of bodily fullness, which is obtained by dividing the weight $\times 100$ by the height cubed. This index is subject to sex, age, and race variations as well as individual variations. In the Belgians the highest index of bodily fullness, (*i. e.* greatest body mass relative to body weight) is found in the first year (male 2.97; female 2.83). In the second year it begins decreasing and continues to decrease in Europeans until the age of 11 years in boys and 10 years in girls when it reaches its minimum (1.19, 1.25). From there on it increases again until it reaches a maximum at 50-60 years (male 1.49, female 1.63), when it begins to decrease again. (Basis of Quetelet's tables.)

But are we to assume from these figures that infants hold to the "herbivorous" type, adolescents to the "carnivorous" type, middle-aged

* The choice of the word "herbivorous" is decidedly unfortunate. The idea conveyed by its use is not that of a vegetarian but of a grass eater. The term might have been applied correctly to Nebuchadnezzar, but to no other person of whom we know.

people to the "herbivorous" type, and senile persons again to the "carnivorous" type? The average individual, classified on the basis of stature and weight, would change his type four times in the course of a long life. The point that I wish to make is that Dr. Bryant has left out of his calculations the changes in bodily form due to age, and who knows to what extent the length of the gut may vary in its absolute and relative size during the life time of the individual?

It will be noted that the index of body fullness is higher in women than in men. Dr. Bryant writes, "There can be no question but that in the human species, the female tends more to the herbivorous and the male toward the carnivorous type. Doubtless, as among the American Indians, the influence of the chase and of the meat diet worked in one direction in the men, and the sedentary habits, hard muscular work, and carbo-hydrate diet of the squaws was active in the other direction, meat and wilderness, civilization and cereals, are still in a sense synonymous." See JOURNAL of Sept. 9, p. 385.

The illustration of the Indians is particularly unfortunate. There is no sex differentiation in diet in the American Indians. The fact that a woman usually carries more adipose tissue than a man does not indicate that the male is more "carnivorous" either in type or in diet.

A perusal of the following figures should make clear the fact that there is no constant relation between bodily fullness and stature.

(MALES). AFTER MARTIN.

<i>Europe.</i>	Stature.	Weight.	Index of Bodily Fullness.
Norwegians	170.0	66.0	1.29
Polish Jews.....	161.0	55.0	1.31
Swiss (Schaffhausen)...	169.4	65.8	1.35
South Russian Jews....	165.1	61.3	1.42
<i>Asia.</i>			
Japanese	163.5	50.2	1.15
Japanese	162.0	52.0	1.22
Sudanese	159.4	51.5	1.27
Koreans	163.1	56.4	1.37
North Chinese	167.6	64.4	1.37
<i>Africa.</i>			
Bushmen	155.4	40.4	1.07
Baluba	169.0	53.3	1.10

It is evident from the above table that the Bushmen who are among the shortest races of mankind are also the slimmest. On the other hand the tall Norwegians are comparatively heavy, whereas the tall Baluba of Africa are slim. The tallest Asiatic race here recorded is also the fattest, and whereas the Javanese and Koreans have practically the same average height, 163.0, which is medium, the Javanese are very thin and the Koreans are stocky. Consequently division of the human race into tall thin and short fats is a purely arbitrary classification.

In his table showing contrasted characteristics of the "herbivorous" and "carnivorous" types

Dr. Bryant makes many statements that are not substantiated by the anthropological investigations of human types which have been painstakingly and accurately carried out by two generations of scientists.

The "carnivorous" type is described as "tall and lanky"; the head is "long, large, rarely microcephalic"; pigmentation is "often excessive"; weight "usually deficient"; back "narrow, round"; forehead "often receding"; cheek bones "prominent"; chin "pointed, long, or short"; ears "thin, long, convoluted"; eyes "close together"; nose "long, thin, prominent."

There are three European races; the Nordic or Teutonic, the Alpine, and the Mediterranean. The Nordic race is tall, blond, heavy boned, and long headed. The Alpine race is usually of medium height, often stocky, pigmentation medium or dark, head round. The Mediterranean race is medium or short in stature, slender, very dark, and long headed. Evidently Dr. Bryant's "carnivorous" type does not coincide with any of the three great racial types of Europe. There are many ethnic types resulting from crosses between these three races, but the only one which corresponds in any way with the "carnivorous" type in the three great criteria of stature, pigmentation, and head form, is a Gaelic type found in western Scotland and Ireland. The potato is the standard article of diet among the Irish Gaels. Of course there may be many individuals with the physical and physiological characters described by Dr. Bryant, but, ethnically and racially, there is no "carnivorous" type, and if it exists in America it must be a very recent development.

Prominent cheek bones are usually correlated with a short broad face and a round head. Associated with long heads one expects long, thin faces, in which the malars are not conspicuous. A long head with a broad, long face and outstanding malars is sometimes found among certain Mongoloid stocks. But usually such a disharmonic type has a long head and a short, broad face, or a long narrow face and a round head. These disharmonic types are generally regarded as the result of crosses between long headed and round headed races. Individually they are comparatively frequent in Europe and America, but in the vast majority of mixed stocks head form and facial form harmonizes. Prominent cheek bones imply a broad face, and where the facial skeleton is thus formed the eyes are almost invariably far apart, and not close together, as in the "carnivorous" type. The tall Nordic race has not prominent cheek bones, nor is the face broad. One of the few racial types in which a long head is associated with a very broad face and prominent cheek bones is the Eskimo. The Eskimo is essentially carnivorous, but is also short in stature, has very heavy bones, and is inclined toward corpulency.

When Dr. Bryant says that this "carnivorous" type is "rarely microcephalic" his mean-

ing is not quite clear. Microcephaly is certainly rare and generally implies idiocy. Microcephalic idiots are generally far below normal stature. If by microcephalic the author means simply small headed we are not much better off, for cranial capacity is correlated with stature and tall races generally have large, capacious crania.

The "herbivorous" type is "short, thickset;" head, "normal, round, square, or sugar loaf;" weight "often excessive;" pigment "usually slight;" ear "thick, wide, simple;" fat "often excessive;" cheekbone "rounded;" eyes "far apart;" chin "square," etc.

This type approaches to some extent the Alpine racial type in Europe and America. But the pigmentation of this type is usually medium or dark, the cheek bones are prominent, it is not excessively fleshy, and the height is medium, except in one Balkan sub-type, the Dinaric type, which is very tall.

The form of the external ear is so variable that anthropologists have never been able to correlate any particular ear form with a racial type, except in the case of the Bushmen. It has been found that criminals in general exhibit a large percentage of anomalous ear forms; the ear in all peoples exhibits a reerudescence of growth late in life; but as a type character it is absolutely undependable.

The "herbivorous" type is said to be subject to hypertrophic arthritis, while the "carnivorous" type is liable to atrophic arthritis. In handling the skeletal remains of many races, I have found hypertrophic arthritis to be most prevalent among the ancient Egyptians, who were a short dark, thin, long headed race with very slender bones. However, hypertrophic and atrophic arthritis are common in the skeletal remains of primitive peoples of whatever height or head form.

Dr. Bryant states that exophthalmic goitre is frequent in his tall, dark, slender, "carnivorous" type. While not presuming to dispute this statement, I may point out that goitre is most prevalent in Europe in the mountain regions where the round headed, Alpine race of medium stature and medium to dark complexion is centered.

Dr. Goldthwait in the JOURNAL of June 17 recognizes similar types in his Shattuck Lecture. Describing the "herbivorous" type, he says (page 886) "The spine is broad and heavy throughout, but in the lumbar region this is especially noticeable. The lateral diameter of the vertebral bodies in this region is considerably greater than the antero-posterior. the articular processes are strong and large and almost always of the crescent shape." This statement is in general true of all human stocks regardless of physical type. He also states that "the lumbar region is short, partly because of the frequent presence of only four lumbar vertebrae and partly because the sacrum is set well down between the wings of

the ilia." Similarly in the "carnivorous" type (p. 884) "the spine is smaller than normal and the lumbar vertebrae are more like the so-called normal dorsal vertebrae in shape, the body being of about the same width laterally as it is deep antero-posteriorly. There are frequently six vertebrae in the lumbar region with the full number of sacral vertebrae, this being one of the reasons for the greater proportionate length of the body. The transverse processes are small and short, and the articular processes are usually flat (not crescentic)." The slender type of vertebra figured by Dr. Goldthwait looks much like a first lumbar. The first lumbar vertebra is phylogenetically a dorsal vertebra, since in the typical Primate the twentieth is the last rib bearing vertebral segment. Man has suffered the loss of a rib in consequence of the lengthening of the lumbar region required for the assumption of the totally erect posture and biped form of progression. Hence the first lumbar vertebra in man partakes of the character of a dorsal vertebra and is occasionally rib-bearing. I have never seen a vertebra like the one figured as the "carnivorous" type of vertebra that was not a first or a second lumbar.

In regard to the variation in the number of presacral vertebrae it may be said that 24 is by far the most usual number. The following figures may be of interest:

25 Pre-sacral Vertebrae.		23 Pre-sacral Vertebrae.	
908 Europeans....	4.3%	1.2%	(Bardeen)
524 Europeans....	6.2%	2.6%	(Fischel)
640 Europeans....	3.9%	4.7%	(Rabl)
358 Europeans....	5.0%	3.0%	(Kelth)

But if the number of presacral vertebrae is decreased the sacrum generally consists of six vertebrae instead of five, and if the number of presacral vertebrae is increased compensation also takes place usually in the sacrum. But Dr. Goldthwait says that his "carnivorous" type often has six lumbar vertebrae with the full number of sacral vertebrae. This then could result only from a reduction in the number of rib-bearing vertebrae.

13 Ribs.		11 Ribs.	
524 Europeans....	6.8%	0.5%	(Fischel)
680 Europeans....	6.2%	0.3%	(Rabl)
908 Europeans....	0.7%	0.9%	(Bardeen)

These two tables show conclusively that the variation in the number of lumbar vertebrae is not sufficiently common to warrant the assumption in question.

Dr. Goldthwait considers that the slender or "carnivorous" type is the more prolific, and that this, in conjunction with the efforts of preventive medicine, makes it the stock from which the race is recruited. He suggests that formerly this was not the prevalent type "as is suggested, at least, by the study of the engravings of groups of individuals, such as were commonly made from 50 to 100 years ago, in which the broad or round faced type is almost the only one shown."

A much more reliable source of information concerning the physical characters of peoples of bygone generations, lies in the study of their skeletal remains. Anthropologists have long been aware that from the prehistoric stone ages in Europe down to the present day, round heads with short faces have been gradually increasing in number in Europe and long heads associated with long oval faces have been decreasing in number. From prehistoric times down to the present the bodily height of European peoples has fluctuated but in the mean has not changed. In England the men of the Bronze Age (1800 B.C.) were taller than Anglo-Saxons. Stature in Great Britain and Southern Germany is less than it was in early historic times. Facts, therefore, do not bear out this assumption of the probable predominance of the slender tall "carnivorous" type.

Dr. Goldthwait also states that the stocky, broad faced type is generally prevalent "in those countries in which modern medicine has exerted but little influence, and consequently infant or child mortality is extremely high. The similarity in the form of the Oriental is apparently to be explained largely by this, as it is true also of the form of the pure African. *The slender type is not often seen among these races.*" (Italics mine.) It is difficult to be sure of what Dr. Goldthwait means by "the pure African", but if, as I suspect, he means the Negro, it should be pointed out that the Nilotic Negroes, the Dinkas, Shilluks, etc., are perhaps the tallest and thinnest group of mankind. A perusal of the Asiatic group of indices of bodily fullness demonstrates also that the Oriental is by no means invariably corpulent.

Africa.		Average Height (Males)
Dinka, Nuer	180.0 cm.	
Sara	181.7 cm.	
Shilluk	177.7 cm.	
Baghirmi, Wadi, Fur	178.0 cm.	
Europe.		
Scotchmen	174.6 cm.	
Englishmen	172.8 cm.	
Swedes	170.9 cm.	
Italians	163.0 cm.	
Spaniards	162.0 cm.	

In the issue of September 9th Dr. Bryant makes a generalization which is likewise disproven by these same Nilotic Negroes, (p 385): "At the equator light and heat are intense; plant growth is abundant, but human growth is stopped by early differentiation and maturity. . . . Man at the equator eats a high carbohydrate diet, the dweller in the temperate zone uses a mixed diet, and the Arctic yields a pure meat with high fat diet."

It has been shown that the Nilotic Negroes living in the upper Nile valley and in the lake region near the equator are very far from stunted in growth. The Latuka who inhabit the upper part of the Sobat, according to the measurements of Sir Samuel Baker, have an average

height of 5 feet, 11½ inches. Their muscular development is powerful. The Turkana, the Karamoyo, and the Kamasia are all people of great stature, and according to Welby, the Turkana frequently exceed seven feet in height. One of the most famous of these equatorial tribes is the Masai who inhabit the region south east of Lake Victoria Nyanza. Sir Harry Johnston says: "The full-grown Masai of pure blood is generally six feet in height by the age of seventeen, though at that time he is often a spindly and cumbersome and ungraceful hobbledohoy. Three years, however, of an exclusive diet of milk, blood, and half-raw beef steaks, combined with a rigorous training in warlike and athletic exercise, have developed him into a sinewy and muscular man, of admirable proportions, broad of chest, with a smallish head, a graceful neck, and limbs whose muscles seem hard as iron." This is sufficient commentary on Dr. Bryant's sweeping generalization regarding stature and diet near the equator.

In the same article, summarizing Treves' evolution of animals as evinced by changes in the intestinal canal, Dr. Bryant says, "Upon the strength of this work, he stated that the carnivore, with its short simple intestine, can be traced back by way of the felines, the canines, the bears, and the racoon, through insects and cheiroptera, to the amphibians and the monotremes, among the latter of which one finds the echidna, and still lower the ornithorhynchus." This is a most amazing statement. If it is true, the ancestry of the "carnivore" jumps from various orders of the Class Mammalia to insects which do not even belong to the Vertebrata.* From there the ancestral tree takes another unexpected upward shoot back to the bats, Order Cheiroptera, Class Mammalia, then downward again to the Class Amphibia, and finally back again to the Mammals in the persons of the echidna and the storied ornithorhynchus. It is almost as if one should say that the ancestry of the earthworm may be traced through the Primates to amphioxus and man, thence to the fishes, mammals, and crustacea.

The ancestry indicated for the "herbivore" is quite as startling. We are almost led to infer that Dr. Bryant believes that the male member of the Genus Homo is descended from a cat and the female from a cow.

For reasons stated in part above, I cannot believe in the existence of the "carnivorous" and "herbivorous" types of man. Anthropologists welcome an invasion of their field by the medical profession which leads to the promulgation of interesting theories such as the one discussed. It is a laudable attempt to bring anthropology and medical science into a working partnership. I have tried to point out that the theory of "herbivorous" and "carnivorous" types of man falls to the ground because it is based largely on incorrect anthropological as-

* It is quite possible that for "insects" we ought to read "Insectivora"—insect eating mammals.

sumptions. If students preparing for a medical course were thoroughly grounded in physical anthropology and zoology, it would very greatly enlarge their field of vision in their later professional career. I think that I do not go too far when I say that I feel assured that such a preliminary training in human evolution and variation would result not only in invaluable contributions to anthropology by members of the medical profession, but would also be instrumental in the advancement of medical science.

Clinical Department.

MUTISM AND DEAFNESS DUE TO EMOTIONAL SHOCK CURED BY ETHERIZATION.

By D. PEARCE PENHALLOW, M.D., BOSTON,

Chief Surgeon, American Women's War Hospital, Oldway House, Paignton, South Devon, England.

L. H., age 25, private in the Durham Light Infantry, was admitted to the American Women's War Hospital July 30th, 1915, suffering from marked emotional shock. At the time of admission he was unable to talk but could write answers to any questions which were asked him and gave the following history:

On active duty at Ypres and had been in the trenches for about four days; he and some other men were on watch on the first of July and some of the party were sitting down in the trenches when two shells from the German lines came over the trench, the first of which fell and exploded just near his feet, killing six men and leaving only himself and a sergeant, and the second burst close to his head. Strange as it may seem, he was not wounded by either shell. Patient states that the noise was terrific and following the explosion of the shells everything became dark and he apparently lost consciousness, and he knew nothing further till he found himself in No. 8 General Hospital, Rouen. When he regained consciousness he was deaf, dumb and blind. A few days later, however, he regained his sight and shortly after that he was able to hear in one ear, still remaining somewhat deaf in the other.

Patient is a well developed and nourished man, rather confused, vague and nervous. On his first night in the hospital, he is said to have answered one question which was asked him by the nurse relative to the trouble, his answer being "concussion." Except on that occasion he did not speak and when asked to speak or make any sound he could, he made expiratory efforts but no sound; when asked to whistle he did the same, even after repeated trials. He was still apparently somewhat deaf, for if he was simply spoken to he paid no attention, but on clapping the hands near his ear or attracting his attention, he would seem to understand what was said; he also stated that he could hear a little bit better with the left ear than with the right. His

coördination, sensation, and motions were apparently normal. There was no tremor of the hands, but a somewhat marked tremor of the tongue. He walked with a slow, deliberate, careful gait, eyes on the ground, toes flexed and held rigidly—a typical "tight rope" gait. With the eyes closed he nearly fell and could not stand on one leg. Knee reflexes moderate. On plantar reflex test he pulled the whole leg away and went into a general body tremor. The toes were spastically extended and later flexed. There was marked photophobia when the eyes were tested with a small electric light.

From admission to the hospital to September 22nd, the patient made no vocal sounds, although he made many attempts. On the latter date he could apparently hear well, the gait in walking had become normal and all tremors and uncertainty had disappeared; the reflexes also were practically normal.

October first it was decided to give the patient primary ether to see if by any possible chance the relaxation would cause him to regain his speech. This was done, and during the etherization he reviewed in a loud tone of voice the whole scene which occurred at the time he lost his speech and on recovery from the ether he was able to talk perfectly well. He also stated that he could hear much better than at any time since he had been in the hospital.

This case illustrates very strikingly one of the many types of emotional shock due to the severe concussion of bursting shells and is reported simply as an unusual case of hysterical manifestation incident to the strain and tension to which the men at the front are constantly exposed.

Medical Progress.

PROGRESS IN PEDIATRICS.

LOBAR PNEUMONIA IN INFANCY AND CHILDHOOD. A SUMMARY OF THE LITERATURE OF THE PAST TEN YEARS.

By JOHN LOVETT MORSE, A.M., M.D., BOSTON.

PNEUMONIA AND BRONCHOPNEUMONIA.

DISCUSSION was still going on at the beginning of this period as to the relative frequency of lobar pneumonia and bronchopneumonia in early life. This was especially true in England, where the hospital statistics showed a considerable preponderance of cases of bronchopneumonia (Whipham, Taylor, Dunlop). It seems to be generally recognized now, however, that the relative frequency of the two diseases is of little or no importance and that it depends largely on the source from which the statistics are drawn.

Age Incidence. The old questions as to whether lobar pneumonia occurs in infancy and, if so, what is its relative frequency in infancy,

were also being discussed at the beginning of this period. Figures were given by a number of writers to show that it did occur, although its occurrence was taken for granted by most authors. It is now generally accepted that lobar pneumonia does occur in infancy. Some statistics were also advanced, especially by the English writers, as to the relative frequency of pneumonia in infancy and childhood. The only figures of value are those of Dunlop, from the Royal Hospital for Sick Children, Edinburgh, because he is the only one who gives also the relative proportion of infants and children admitted to the hospital. In this institution 33% of the patients admitted and 30% of the cases of pneumonia were under two years of age. It would seem from these figures as if pneumonia was as common in infancy as in childhood. As a matter of fact it is of not the slightest importance whether it is more common at one age or the other, except as regards prognosis.

Macdonald has reported a case of antenatal pneumonia. The mother was ill with pneumonia when the baby was born. It was cyanotic at birth and very feeble. It coughed but little and died in twenty-eight hours. The autopsy showed a lobar pneumonia and a few other minor lesions. He gives references to the literature of the subject.

Frequency in Boys and Girls. Several papers contain statistics which confirm the well-known fact that pneumonia is more common in boys than in girls, even in infancy. The combined figures of Dunlop, Whipham and Baginsky show that a little over 60% of their patients were boys.

Mortality. Most authors have been satisfied with the statement that the mortality is high in infancy and low in childhood. Instances of the high mortality in infancy are given by Chapin for the New York Postgraduate Hospital, 36%; by Whipham for the Evelina Hospital, London, 37.5%; and by Dunlop, for the Royal Hospital for Sick Children, Edinburgh, 26.6%. Chapin states, however, that the mortality at the Babies' Hospital, New York, is only 10%. In comparison, the mortality at the Royal Hospital for Sick Children from two to twelve years of age, was only 2.9%. Many other writers call attention to the fact that the mortality is lower in private than in hospital practice. McNeil has reported in this connection a series of cases of sudden deaths in institutional children in whom the lesions of pneumonia and the evidences of status lymphaticus were present together.

Location. Otten, Weill and Mouriquand, and Dunlop have given statistics as to the location of the pneumonic process in 531 cases. The left lower lobe was involved in 41%, the right upper in 30%, the right lower in 24%, and the left upper in 5%. These figures corroborate the general belief as to the relative frequency with which the lobes are involved.

Duration. There is nothing very new as to the duration of the fever, all writers recognizing that while the average duration is about seven

days, it may be longer or shorter. Otten, in a study of 250 cases, found that the usual duration was from seven to nine days. It was less than seven days in 10%. Whipham, in a study of 150 cases, found that the duration was from five to ten days in 68%. Chapin, in his cases, found variations of from seven to twenty-five days.

Many of the authors take up the much-discussed question as to the occurrence of short or abortive cases of pneumonia. Most of them are convinced that such cases do occur. Kerr has taken this subject up quite thoroughly in a paper entitled "Twenty-four, Forty-eight and Seventy-two Hour Pneumonias in Children." His argument is as follows: The essential symptomatology of pneumonia during the first twenty-four hours is: 1. Sudden onset with immediate and sustained high temperature, and a dry, hot skin. 2. Early prostration to the extent that the child will give up and show the visible signs of his illness. 3. Markedly increased respiration, with a decided disturbance of the ratio between pulse and respiration. 4. The exclusion of all other possible causes for the symptoms. Aside from these, there are symptoms which are corroborative, such as definite physical signs in the chest, initial vomiting, chill or something which approximates it, and primary paleness of the face with subsequent unilateral flushing.

He reports six typical cases of the usual duration to show these symptoms of onset. He then argues, "If we are able to diagnose cases early, before the appearance of physical signs, which prove later to be pneumonia, why should not the presence of these symptoms alone justify the diagnosis of pneumonia?"

He reports then six cases of short duration with the typical onset and picture of pneumonia. Five had slight physical signs in the chest. All terminated by crisis.

Armstrong has reported four cases of relapsing pneumonia in young children, in which the duration was from nine to thirteen weeks. They all began acutely and showed signs of lobar consolidation. The process then spread from spot to spot, not involving the whole of a lobe at the same time. The temperature was irregular. The signs of solidification were so marked that the presence of fluid was suspected in three cases. The pneumococcus was grown from the fluid obtained by lung puncture in two instances. All the patients recovered.

Sutherland, in a paper with a title of "Chronic Pneumococcal Infection of the Lungs in Children," calls attention to the frequency of the presence of physical signs in the lungs in children which suggest phthisis. He examined the sputum of 230 children, suspected of having pulmonary tuberculosis, and found tubercle bacilli in only 9.1%. He then injected the negative sputum of 69 of these children into guinea-pigs. Only 2, or 2.9%, of these pigs developed tuberculosis; 43.5% of the guinea-pigs inoculated intraperitoneally with the sputum from

these children developed peritonitis. The organism in every case but one was the pneumococcus. The pneumococcus was also found in large numbers in the negative sputa, and was by far the most abundant organism. He believes, therefore, that the pneumococcus may and does cause a chronic affection of the lungs in children. He also calls attention to the fact that pulmonary tuberculosis is a rapid and progressive disease in children and concludes that chronic pulmonary lesions in childhood are usually not tubercular.

In this connection should be mentioned a paper by Riesman in which he describes several cases in which the physical signs were limited to a lower lobe. These signs were dullness, diminished and slightly changed respiration and râles. The temperature was slight or moderate. The duration was months and all the patients recovered. He thinks that the pathological process was bronchopneumonic in type, but confined for some reason to a single lobe.

SYMPTOMATOLOGY.

Much has been written as to the symptomatology of pneumonia. There is little which is new, however, most of the data advanced merely corroborating or emphasizing points already well known to pediatricians. It will probably be worth while, however, to review the symptomatology briefly, as many of these points may be new to, or have been forgotten by, the general practitioner.

Temperature. The duration of the fever has already been referred to in speaking of the duration of the disease. Most writers emphasize the frequency of remissions or intermissions in the temperature in pneumonia in children, in comparison with the continued high fever in adults. Otten, however, thinks that it is more continuous than is generally believed.

The relatively greater frequency of the fall of the temperature by lysis rather than by crisis in infancy and childhood than in adult life is referred to by all. The temperature came down by lysis in 31.6%, 16% and 15.3%, respectively, of Otten's, Dunlop's and Whipham's patients. All mention the frequency of pseudocrises.

All those who have written about the temperature in detail emphasize the fact that the temperature is almost always high in pneumonia in infancy and childhood, and state that too much attention should not be paid to it, simply because it is high. Chapin, for example, says that the height of the temperature makes no difference in the prognosis of pneumonia in infancy, and that temperatures up to 105°F. are well borne. Dunlop, however, states that temperatures over 105°F. are of serious import. Lowenburg, on the other hand, says that energetic treatment is unnecessary unless the temperature is continuously as high as 106°F., or over, while Northrup warns against treating patients according to the indications of the thermometer,

and says that what one can know without the thermometer is far the most valuable.

Onset. Nothing new has been brought forward as to the nature of the onset of pneumonia at this period of life. Several writers emphasize the frequency of vomiting at the time of the onset, and several point out the fact that initial convulsions are not nearly so common as would seem to be the case from the text-book descriptions. Northrup sums up the early manifestations of pneumonia in infants as follows: sudden onset with fever, prostration ("dopey"), disturbed respiration-pulse ratio.

Respiration-pulse Ratio. Most writers emphasize the importance of a change in the normal respiration-pulse ratio in the diagnosis in instances in which the physical signs appear late, that is, a change from the normal ratio of 1 to 4, to one of 1 to 3 or, more often, especially in infancy, to one of 1 to 2. Fleischner differs from almost all the other authors in his statement that the respiration-pulse ratio is of little importance in the diagnosis of pneumonia in infants. The reason which he gives for this statement is that this ratio is disturbed in all acute febrile conditions at this age.

Freeman describes pneumonic respiration as inspiration, pause, expiration with grunt. Ott describes a post-inspiratory pause which he considers pathognomonic. He says: "The respiration of pneumonia in infancy and childhood has a positive and pathognomonic post-inspiratory pause. This pause is not continuous. There are usually three to five post-inspiratory pauses, then follows rapid rhythmic respiration without a pause, which ends in one post-expiratory pause, and then the post-inspiratory pauses begin again. There is a different cycle in the recurring post-inspiratory pauses, which vary in number from two as a minimum to six as a maximum before the period of rapid pauseless respiration sets in." The peculiar point is the single, long expiratory pause which links the two changes. He names this symptom the pneumonic-respiratory-pause-cycle.

Physical Signs. Almost everyone calls attention to the absence or indefiniteness of the physical signs in the lungs in the early days of the disease and to the fact that in some instances they may not appear until at the time of, or even after, the crisis, and sometimes may always be lacking. Almost everyone also believes that it is possible to make a diagnosis of pneumonia in the absence of physical signs. Freeman's statements that "the most important fact is that the pneumonia of infancy is a disease that should be recognized independently of signs ascertained by percussion or auscultation of the chest, such signs being valuable to corroborate the diagnosis and to locate the lesion," and "the general picture of the disease is usually sufficient for an accurate diagnosis, and if one waits for the physical signs elicited by auscultation and percussion he may have to

wait until the patient is convalescent or never make a diagnosis in a well-marked case," represent very well the general feeling as to this point. Fleischner stands practically alone when he states that the diagnosis in infancy must be made on the physical signs.

Fleischner emphasizes the fact that a diminution in the intensity of the respiratory murmur on the affected side is the most characteristic sign of the early stages of the disease. He also states that light percussion will bring out changes which will be missed by heavy percussion. Dunlop calls attention to the frequency and importance of a tympanitic percussion-note in the early stages. He also calls attention to the absence of crepitant râles in the beginning of pneumonia in infancy. Northrup, on the other hand, speaks of râles as an early sign. Several writers call attention to the well-known fact that the signs of solidification are often first evident high in the axilla.

The investigations of Weill and Mouriquand with the Roentgen ray seem to have settled the much-discussed question as to the existence of central pneumonia. Their results also explain the late development or absence of physical signs in many instances and the early appearance of signs in the axilla. They show that the pneumonic process never begins in the centre of the lobe, but always on the surface. The first shadow is triangular in shape, the base being at the surface of the lung. This triangle is often visible when there are no physical signs. In many instances, however, more careful examination in this area will reveal slight signs which were not previously noted. The absence of physical signs may be due to the small size of the area of solidification, to the fact that it does not reach a large bronchus, or to its situation high in the axilla, beneath the shoulder joint, or at the base of the lung. The triangular shadow gradually increases in size, the apex drawing nearer to the root of the lung. Finally it is obscured as the process extends and becomes more general. It reappears during resolution and is the latest as well as the earliest picture. Their work has recently been confirmed by Mason of New York, but his results have not yet been published.

A number of authors, notably Dunlop, have called attention to the rapidity with which the physical signs of pneumonia disappear in infants and children after the crisis. Several authors, basing their opinion on this usual rapidity of disappearance, state that, if the physical signs persist, there is always some complication present, usually empyema, sometimes tuberculosis. In the writer's opinion, this statement is too sweeping, because he has seen the signs persist for several weeks, and in some instances months, and then quickly clear up in a few days. Sutherland has hinted of such conditions in his paper, already quoted. In general, however, the rule holds that persistence of the physical signs

means the development of some complication, usually empyema.

Pain. Almost everyone who has written regarding the symptomatology of pneumonia in childhood has emphasized the fact that the pain in pneumonia at this age is often referred to the abdomen, and that the younger the child the more likely is the pain to be so referred. They all call attention to the danger of mistaking pneumonia for some acute abdominal condition, especially appendicitis, on this account. They emphasize the importance of the change in the respiration-pulse ratio and of the absence of localized muscular spasm in the diagnosis. A few call attention to the facts, which are often forgotten, that the primary trouble may be in the appendix, that a child may have both pneumonia and appendicitis, and that appendicitis may develop in the course of pneumonia.

Cough. Northrup and Freeman emphasize the importance of cough as an early symptom in the diagnosis in cases in which the physical signs in the lungs are late in making their appearance. Lowenburg, on the other hand, calls attention to the fact that cough is often not a prominent symptom and that it may not develop for several days.

Rigidity of Neck and Upper Extremities. Freeman makes a point of the value of rigidity of the neck and upper extremities without rigidity of the lower extremities in diagnosis in early cases before the appearance of signs in the lungs. This rigidity is the result of the soreness of the chest and the child's effort to protect it.

Meningeal Symptoms. Many writers speak of the frequency of symptoms of meningeal irritation in pneumonia at this age, and of the infrequency of true pneumococcus meningitis. Otten, in a study of 250 cases, found symptoms of meningeal irritation in 34, or 13.6%. Two of these children had purulent meningitis, two had uremia from nephritis, and four had a severe general infection. In 26 the condition was what he terms "meningismus." Focal symptoms were absent in all of these and all recovered. The fluid obtained by lumbar puncture in three instances was increased in amount and under high pressure. It was clear and contained very few cells and no organisms. He refers to Kirschheim, who got similar results from lumbar puncture in thirteen cases. He concludes, therefore, that the meningeal symptoms in pneumonia are due, in the vast majority of instances, not to inflammatory conditions, but to circulatory disturbances.

Albuminuria and Nephritis. Otten found albuminuria in 115 of 250 cases, 46%, and nephritis in 4, 1.6%, of whom two died.

Leucocytosis. Most writers have said very little about the leucocytosis of pneumonia in children, merely referring to it as being present. A few have given figures. Chapin, for instance, found a polynuclear leucocytosis in all but one of 17 babies. The baby which did not show a leu-

cocytosis was very feeble, showed all the evidences of poor resistance and died. There was, however, an increase in the proportion of polynuclear cells in this instance, as in the others. The highest count was 34,800. Otten found a white count of from 15,000 to 20,000 in about three-quarters, and of from 25,000 to 52,000 in about one-quarter of 72 cases. The counts were normal in a very few. In only one instance did the count fall before death.

Bacteriemia. Otten made bacteriological studies of the blood in 70 cases and found pneumococci in the blood in 9, or 13%. Four of these children lived and five died. He was unable to make out any relation between the clinical picture and the bacteriological findings.

Complications. Everyone has called attention to the frequency of empyema as a complication of pneumonia in infancy and childhood, the difficulty in its diagnosis and the methods to be used, the importance of its early recognition as regards prognosis, especially in infancy, and its high mortality in babies. Nothing new has, however, been added to our knowledge. Several have called attention to the frequency of otitis media as a complication. Otten states, probably truly, that it is the most common complication. Barrington-Ward reports a case of pneumococcal abscess of the lung in a boy of six and gives a brief review of the literature of this rare condition. The fact that Otten had three cases in a series of 250 suggests, however, that it is not so rare as has been supposed.

(To be concluded.)

Reports of Societies.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Continued from page 95)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.

AN ANALYSIS OF THE VALUE OF LABORATORY METHODS USED IN THE EXAMINATION OF CEREBROSPINAL FLUID.

DR. RICHARD DEXTER and DR. CLYDE K. CUMMER of Cleveland, Ohio, presented this paper. They stated that they had examined a number of spinal fluids by means of the Wassermann reactions, cell count, globulin reaction, and more recently by the Lange colloidal gold reaction. During the past year and one-half they had been using even larger amounts of spinal fluid in doing the Wassermann reaction than had been used by Swift and Ellis.

They had followed the technique described by Walker and Swift, using increasing amounts of spinal fluids, 0.1 c.c., 0.2 c.c., 0.3 c.c., 0.4 c.c., 0.5 c.c., and 1.0 c.c. In a series of 177 spinal fluids from cases with indubitable signs of lues of the central nervous system in which these various amounts were used it was evident that by using 1.0 c.c. of spinal fluid as a maximum amount a positive Wassermann reaction was obtained in 21.4% more fluids from known luetics than when only 0.5 c.c. was used as a maximum. A comparison of the positive Wassermann reactions in the spinal fluids with their cellular complement and globulin was of interest. Out of 63 cases in which the cell count and globulin was done and in which the Wassermann reaction was positive with amounts of 0.5 c.c. of spinal fluid or less, they found that both cell count, and globulin were increased in 69%, the cell count alone was increased in 1.5%, globulin alone was increased in 14.3%. Neither cell count, or globulin was increased in 14.3%. On the other hand, out of 78 fluids showing a positive Wassermann reaction in 1.0 c.c. only, they found that both cell count, and globulin were increased in 16.5% cell count alone was increased in 11.1%, and globulin alone was increased 16.5% neither cell count or globulin was increased in 55.5%. It was apparent therefore that when the Wassermann reaction was positive in 0.5 c.c. of the spinal fluids or below the greater were the chances that there would be an accompanying increase in the cell count and globulin content. Whereas, in those fluids which showed only a positive reaction in amounts above 0.5 c.c. one was less likely to find an increase in the cellular elements or the amount of globulin. The importance of this from a diagnostic standpoint was obvious. The question as to whether non-specific binding might not occur when such large amounts of spinal fluids were used would naturally arise and they felt that the answer to this question might be found in the following observations: Out of a total of 132 spinal fluids where lues were either non-existent or non-active, they found only one which reacted positively to the Wassermann reaction when the maximum dose of ten times the lowest dose of spinal fluid was used and this was by no means a strong reaction, as against 131 which were negative under the same conditions. After describing Lange's colloidal gold reaction and his findings the assayists stated that it was their experience that the curves described by Lange occurred with considerable regularity. They had followed the technique laid down by Lange in his original article.

In summing up the results of this investigation of 48 cases of syphilis involving the nervous system they had found the cell count increased in 33 or 68.7%. The globulin content was increased in 32 or 66.6%, which paralleled the cell count very closely. The Wassermann reaction was positive in 34 or 70.8%, of these 48 spinal fluids, while they found either strong or weak positive colloidal gold reactions in 77.1% of the cases. It was probable that the high percentage of positive Wassermann reactions obtained in this series was due to the fact that 1.0 c.c. of spinal fluid, ten times the Wassermann test dose, was used as the maximum amount. In spinal fluids from 23 cases without any sign of syphilis they had found 21 negative colloidal gold tests and two very weakly positive reactions. In three cases of tuberculous meningitis from which they had examined the spinal fluid they had not seen the typical curve described by Lange and others.

DISCUSSION.

DR. WM. E. ROBERTSON, Philadelphia, Penn.: I have reached the same conclusions as the authors with respect to the amounts of spinal fluid to be used in making the Wassermann test. In my earlier work I stated that 4, 6 and 8 were routinely employed, but series of observations led me to the conclusion that larger amounts are necessary, and for two years I have used routinely 3 tubes containing $\frac{1}{2}$ c.c., 1 c.c. and $1\frac{1}{2}$ c.c., respectively. Occasionally only the largest amount will yield a positive result, the others being negative. In paresis, however, it is the rule to find all three tubes positive. In every instance, I not only made a Wassermann on the spinal fluid but counted the cells, did a Nonne, Noguchi, Fehling's and gold Sol test. With regard to the count, I wish to refer to the very interesting work of Dr. Paul Weston of the Warren State Hospital, Pennsylvania, who made a very large number of counts and found that they varied day by day and without any apparent reason. So striking was this that Dr. Weston was led to the conclusion that counting the cells was of no practical value. In all instances, Dr. Weston's counts were made within a few minutes of taking the spinal fluid, so that no opportunity for cytotoxicity was given. I have had no opportunity to make such daily studies of the cell counts, but in my experience there was always a direct relationship between the degree of pleocytosis and the protein content of the spinal fluid. As to the gold sol, though the preparation of the solution was extremely difficult, the application of the test was very simple and the results of considerable value, not alone in suspected cases of syphilis, but in disease of the brain and cord or their coverings, whether of a primary or secondary nature. For instance, in uremia one finds almost constantly that the first tube will go down completely while the others remain unchanged, or but so slightly changed as to be of no special moment. In one instance with a negative Wassermann both in the blood and spinal fluid, with a low cell count, an absent Nonne and Noguchi and reduced Fehling's, tube number five became water clear, while all the rest remained unchanged. In genuinely specific cases the Gold Sol reaction is a variable one; for instance in advanced cases of paresis and tabes, all of the ten tubes which we employ in our series may become water clear. Speaking very generally, we have usually found that the curve of paresis is more apt to be irregular, the first two or three tubes being water clear, then two or three tubes of variable color, while perhaps 6 and 7 may again be water clear with little or no change in the last two or three. In the tabetics of the less advanced type the earlier changes will be slight, while tubes 4, 5 and 6 will often be water clear and perhaps the rest of the series water clear. In one case of gumma of the brain the first two tubes were slightly changed, while the remainder from the 3rd to the 10th were all water clear. In one case of multiple sclerosis in which the spinal fluid was under considerable pressure, as is usual in this type of case, there was a negative Wassermann both in the blood serum and in the spinal fluid, with a very slightly increased cell count, with a slightly positive Nonne and Noguchi, Fehling's reduced, and the Gold Sol showed no change in the first six tubes, slightly progressive change in the 7th and 8th, while the 9th and 10th were water clear.

We do not feel that our own work has been sufficiently extensive to enable us to draw definite con-

clusions upon the value of the Gold Sol reaction, but one thing we can state most positively, and that is, that the character of the curve varies materially with the improvement or retrogression of any particular case, and in two instances in which we had had positive Wassermann reactions in cases of tabes, with marked Gold Sol reactions, when the patients improved clinically and the Wassermann reactions became negative, the Gold Sol likewise became negative.

DR. GEORGE P. SANBORN, Boston, Mass.: We have made about 200 observations, and in paresis we have obtained from the analysis of the cerebrospinal fluid exactly what was obtained at the Johns Hopkins Hospital in Baltimore in tabes. In tabes we have never gotten tubes that were absolutely decolorized. In the suspected cases which gave the clinical signs of tabes and those alone, the tubes were decolorized in the first three or four days; but in these cases the nerve infection was very extensive, more so than even the clinical diagnosis suggested. In other words there may have been a paretic element in the case.

We also found that after the injection of the salvarsanized serum in a number of cases the intensity of the gold reaction diminished with the successive treatments. In some instances from three to four days. I have never yet seen a case of tabes in which we could not get any definite decolorization in one tube and an ordinary growth in the rest of the tubes.

DR. RICHARD DEXTER, Cleveland, Ohio: The use of small doses I believe to be admirable in the treatment of such cases; one can see the reaction diminish under such a treatment, and I believe it is well to continue the treatment with these small doses made of a definite titration.

With regard to the so-called typical curve occurring in tabes, in Germany as well as in America, also in other countries, there has been described the typical curve.

(To be continued.)

Harvard Medical School.

PRESENT USES OF X-RAY.*

I. THE PHYSICAL CHARACTERISTICS OF THE X-RAY.

DR. H. W. VAN ALLEN of Springfield, Mass.

Origin. When an electric current of high voltage is passed between two points through a relatively high vacuum, there takes place from one of the points (kathode) a discharge of electrically charged gaseous particles known as the kathode stream. In an ordinary tube the vacuum is not very high and the kathode stream is composed of striae of luminant gas particles, giving off a peculiar glow. In tubes of higher exhaustion there is simply a fluorescence to be seen on the walls of the tube.

The kathode stream produces x-rays when it comes in contact with any substance which stops its progress, and the x-rays so produced vary in quality according to three factors: (a) The voltage of the current and therefore the velocity of the bombarding kathode stream; (b) The character of

* Lectures at the Harvard Medical School on January 7, 1916.

the gas; (c) The atomic weight of the target or substance impinged upon. The variation in the quality of x-rays must be recognized as being very wide—comparable to the variation in color—and is of great importance therapeutically.

The Soft Tube. When the vacuum in the tube is less perfect it is called a soft tube. The x-rays produced are more caustic in their superficial action, have less penetrative ability and have less selective influence on certain types of body cells. Tubes may also be made softer in action by employing a current of lower voltage. Tubes become soft anyhow in course of time. And since soft tubes are more caustic superficially and valueless for deep penetration, you are here distinctly warned against buying x-ray machines of low voltage, the cheap "portable outfits" which are dangerous as well as inadequate. Soft tubes make more time necessary in fluoroscopic work, and, hence, expose the patient and operator to burns. Soft tubes may stimulate a superficial neoplastic growth where a hard tube by reason of its selective influence would destroy the growth.

Hard Tubes in which the exhaustion is more complete require higher voltage and give rays of shorter wave-length, greater penetration and a more distinct selective destructive action on certain types of cells.

Coolidge Tubes represent a great advance in roentgenology because of the fact that they are more constant in their action. The kathode stream in the Coolidge tube consists of vaporized tungsten, and the greater atomic weight of the tungsten target, together with the increased voltage which the tube is capable of standing, produces rays of very greatly increased hardness, of constant and controllable hardness, and much greater penetrative power. It must be emphasized that experience with the Coolidge tube is not yet adequate for us to say what its chronic effects may be. We should use the greatest caution in using the Coolidge tube because of its great power.

Measurement of x-rays is more important now that the Coolidge tube has come into general use. Hansmann's radiometer is of value, and depends on color changes effected (by ionization probably) on card board plaques of barium platinocyanide.

The use of filters depends on the fact that x-rays are produced in mixtures of hard and soft, and, therefore, if the hard rays are to be applied long enough to be effective in deep penetration, the soft rays must be removed or serious superficial burns would result. Aluminum 1-3 mm. in thickness is used as a screen. As x-rays may produce secondary rays whenever they are stopped, a secondary screen of sole leather is used beneath the aluminum.

The application of the x-rays contains many mechanical and mathematical problems. The intensity in the effect of the x-rays varies inversely as the square of the distance at which they are applied. By application of the constant hard rays of the Coolidge tube over different two-inch squares on the abdomen, each application being directed toward a given locus, *e. g.*, a myoma of the uterus, it is possible to give the deep structure far more treatment than would be possible from an application over a single area. This method of application is called cross-fire.

The effect of x-rays on cell life is two-fold: first stimulatory, second and subsequent, destructive. Plants treated with x-rays grow better than unexposed controls,—but, if subjected to prolonged

treatment, die. More than 36 hours of x-ray exposure results in irregularities and abnormalities of growth in the chick embryo. Though it is well known that x-ray operators have in many cases become sterile, it is not so generally known that in the neighborhood of one-third of the offspring of x-ray workers have congenital anomalies of structure. Rapidly growing cells are most sensitive to x-ray influence; lymphoid tissue, cartilage, vascular endothelium and spermatocytes being notably non-resistant. Cells behave differently at different times and thus often repeated small doses may be more effective than massive dosage. The x-ray burns are serious because proper regeneration is greatly delayed. Other tissues suffer severely also. Burns may last ten years or more.

In medical treatment x-ray applications are of service in many conditions, of which the following are examples:

Psoriasis.—The lesions do not have to be exposed directly to the x-rays. Treatment applied to back and thighs has been followed by complete recovery of severe psoriasis of the scalp.

Leukemia.—Cases have been improved by large doses of x-ray.

Secondary Anaemia.—Cases improve with small doses, given as stimulant.

Tuberculous Adenitis.

Hyperidrosis.

Acne.—Especially the acne of early maturity, when freedom from acne on the face is especially welcomed by the patient.

Superficial Epitheliomata are especially adapted to x-ray treatment. Eighty-five per cent may be cured. Warts also are very well adapted for x-ray removal.

Experiments on mice have shown that previous x-ray exposure markedly discouraged the growth of repeated transplants of tumors. There is, therefore, a question whether x-ray treatment before operation for carcinoma would not help to prevent "surgical transplants" during the operation, and recurrence in the scar.

II. THE VALUE OF X-RAY IN DIAGNOSIS.

DR. L. G. COLE of New York.

The value of the x-ray in diagnosis depends on the clearness of the plates and on the judgment and experience of the interpreter. In considering the factors which improve the clearness of the plate we must note that the direct rays come from the focal point on the anode and pass in all directions from it, and, when strong, give a good picture. The indirect rays come from many points on the wall of the tube and therefore blur the shadows cast from the anodal focal point and make the picture foggy. Both direct and indirect rays on striking the tissue give rise to secondary rays which further befog the picture.

To review in barest outline, we shall consider the following topics. (Slides were shown to illustrate the subjects).

1. *Foreign Bodies.* The x-ray will show any object possessing greater or less density than body tissues. Metal markers on the surface are of great value in localization of the foreign object. The depth of a foreign body may be calculated by taking two plates at two different known angles and comparing the positions of the shadow.
2. *Fractures* (a) Radiographs should be made when you don't think you have a fracture.

Dislodged fragments around joints and long, oblique fractures will be missed unless plates be taken.

- (b) Radiographs should be made where there is no question of fracture but of position. In New York law if a doctor fails to advise x-ray plate where there is proven to be fracture and it is possible to have the plate made, he is legally responsible.
3. Anomalies—Cervical ribs, etc.
4. Bone Lesions—Sarcoma of the elbow, destruction of ilium by hypernephroma, tuberculosis of hip joint, epiphysis where the roentgen findings may precede any clinical symptoms, tuberculosis sicca of shoulder joint shown as examples.
5. Abnormal closures of intervertebral foramina with pressure symptoms referred to periphery.
6. Sinus, tumors of sella turcica, teeth, cysts of jaw and other head conditions.
7. Stone in kidney, ureter and bladder.
8. Chest Lesions. Roentgen findings are to be depended on, even in the absence of clinical symptoms, and negative roentgen findings are to be depended on even against clinical signs. Cole advocated, in 1906, talking in terms of the number of miliary tubercles seen at various times in the course of a case. Clinical experience has borne out the value of this procedure. Tubercles will show when dullness will not be present. Training in interpretation is of great importance in roentgenology of thoracic contents.
9. Gastro-Intestinal. Here the utmost thoroughness and experience are necessary. For a complete gastro-intestinal examination, 60 plates are taken by the speaker. No diagnosis should be made on gastro-duodenal cases from less than 40 plates. These plates should be taken as routine and studied as a complete series after all have been taken.

X-ray shows normal stomach to go through repeated complete cycles of systole and diastole. During systole, food is squirted into the cap, not occasionally, but on every peristaltic contraction. The cap is emptied by the duodenal mechanism, and the sphincter, therefore, does not mark the limit of the physiological stomach. The reaction in the cap is acid; embryologically and histologically the cap belongs to the stomach and it is here that the finishing touches of protein digestion begun in the stomach take place. Ninety-eight per cent. of the duodenal ulcers are found here by the surgeon.

Roentgen evidence of carcinoma has the "finger and thumb imprint" as its most characteristic sign. This peculiar form of constriction is constant in the different plates. The majority of carcinomata show normal duodenal caps.

Roentgen evidence of ulcer includes the deformity of the cap, the presence of a clearly outlined crater, and irregularity in the rugae and in the progress of peristalsis.

Roentgen diagnosis is far too accurate a method of diagnosis to be regarded as a mere accessory. Careful study in the interpretation of a good series of gastro-intestinal plates will give 90-100% accuracy in diagnosis without the help of any other clinical procedure.

R. W. LOVETT, M.D.
ALAN GREGG, A.B.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, JANUARY 11, 1916, 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

EXHIBITION OF CASES.

DR. CHRISTIAN: A patient with a large intrathoracic dermoid cyst.

Paper of DR. W. B. CANNON and MR. MCKEEN CATTELL:

SOME CONDITIONS CONTROLLING THYROID ACTIVITY.

It has been known for a long time that the activities of tissues are manifested by electrical changes. In 1885 Davis and Bradford made observations of this nature on the salivary glands. Later in the nineties further studies were reported on the glands of the gastric wall. These represent, as far as is known, the only investigations of such electrical changes on the glands within the body.

Use has been made of this method (with a string galvanometer) in ascertaining the activity of the thyroid gland. First, however, a gland with an external secretion—the salivary glands—was tested as a control. From a series of experiments it became clear that the electrical changes noted are in reality the result of the secretion of the gland.

In such studies as these a knowledge of the innervation of the thyroid gland is of the greatest importance. It was finally shown by means of stimulation experiments that the sympathetic system is a controlling factor in regulating thyroid activity. Adrenalin, which is a stimulant of the sympathetic system, has been found to cause quite remarkable action currents. Pilocarpin, on the other hand, brought about no appreciable change in thyroid activity. Pilocarpin stimulates the autonomic system, hence it is the sympathetic and not the autonomic supply which controls thyroid activity.

From experiments conducted with pituitrin it appears that these action currents, and therefore the thyroid secretion, are due, not to vasoconstriction and anemia, as one might suspect from the use of adrenalin, but to impulses entering the gland cells through nerve fibers.

The splanchnic nerve when stimulated leads to a discharge of adrenalin from the suprarenal glands. When the splanchnic is stimulated and note is taken of the action currents in the thyroid, curves are obtained which show a secretion in the thyroid gland.

This work represents the first demonstration of an interrelation between the glands of internal secretion. It seems probable that the thyroid has a function connected with the function of the sympathetic system. The emergency function of the thyroid may be one correlated with the periods of demand for great activity. It may be stirred up, then, at such times so that it leads to an acceleration of the activities of other glands.

DISCUSSION.

DR. CUSHING: Dr. Cannon, in this very clear and interesting exposition of a small part of his work, has opened up a new field which may serve to deter-

mine the interrelations of the whole system of internal glands. We now begin to understand through the study of the neurogenic supply of the thyroid gland that fright may really be an etiological factor in the development of exophthalmic goitre, as clinicians have often supposed.

Paper of Drs. A. FORBES and R. H. MILLER:

DETECTION OF AFFERENT IMPULSES IN THE BRAIN STEM AND THEIR ABOLITION WITH ETHER ANESTHESIA IN RELATION TO THE THEORY OF ANOCI-ASSOCIATION.

Crile has asserted that ether does not serve to protect the brain from afferent impulses. The experiments reported tonight were undertaken to confirm or to disprove this hypothesis.

Records were made of action currents in the afferent nerve fibers by means of a string galvanometer.

Control experiments were first necessary to show that action currents in the nerve fibers directly stimulated were not abolished by profound anesthesia. Last spring we found that profound anesthesia which does not interfere with respiration did not abolish the action currents in such nerves.

Since some afferent neurones extend as far forward as the medulla, it was necessary to work centralward to this region. It was also desirable to have preparations which could be studied alternately with and without anesthesia. Accordingly, decerebrate animals were used with the transection made back of the optic thalamus at the anterior edge of the anterior corpora quadrigemina. This gave a maximum length of the second chain of neurones consistent with motionless decerebrate rigidity.

The stimulating current was applied to an afferent, peripheral nerve,—the sciatic. The non-polarizable electrodes of a string galvanometer were connected with the brain, one on the dorsal aspect of the brain stem and another at the bottom.

The results demonstrated that moderate surgical anesthesia abolishes one of the two forms of curve obtained without it. This probably represents the action current in the central neurones. It takes place about the time the flexion reflex disappears, which is long before the ether is deep enough to interfere with the respirations. Hence ether is to a considerable extent effective in protecting the cortex from peripheral stimuli.

DISCUSSION.

DR. CHRISTIAN: This work of Drs. Forbes and Miller is of great importance to the surgeon as well as to the physiologist. It seems to afford a definite demonstration that ether definitely blocks afferent impulses. If this be true, our present views on anoci-association are not very secure.

DR. CUSHING: This is a very important and interesting communication to us all. Dr. Crile's estimate of such effects, however, is based on changes in the cells of the cerebellum. Dr. Forbes, I believe, has not yet studied the action currents in that part.

DR. CANNON: Nerve cell changes are subject to great personal variations. I have had occasion to observe this in some personal work. I have also seen the preparations of Dr. Crile, and alongside of the faded cells there are well-colored, normal appearing cells. Dr. Allen has recently induced shock in animals, and has not obtained similar results to Dr. Crile. Because of the unreliable results, of the lack of confirmation, and from Dr. Forbes' results, I

believe that ether does to afferent impulses what it does to efferent impulses.

DR. BOOTHBY: Such studies as Dr. Forbes has made should be carried on with ether under known vapor tensions.

ERNEST G. GRAY, M.D.

Book Reviews.

Publications from the Jefferson Medical College and Hospital. Vol. VI. Philadelphia.

The Jefferson Medical College has published in book form a series of original articles by various members of its staff. The volume contains eighteen articles which, unlike those appearing in Vols. I, II and III, have not been previously published. The volume is well illustrated. Several articles written particularly about laboratory equipment and museum appliances are full of suggestions. Of the value and interest of its scientific papers there can be no question.

Encyclopedia Medica. Second edition, under the general editorship of J. W. BALLANTYNE, M.D., C.N., F.R.C.P. Vol. II. Edinburgh and London.: W. Green and Son, Ltd. 1915.

The first volume of this standard medical encyclopedia was reviewed in the issue of the JOURNAL for September 9 (Vol. clxxiii, page 397). The present volume continues the work through the captions from aspiration pneumonia to chlorodyne. The separate articles by various well known authors or revisers are frequently illustrated with text cuts. The volume continues the important and valuable work already so satisfactorily begun.

Cancer, Its Study and Prevention. By HOWARD CANNING TAYLOR, M.D. Philadelphia and New York. Lea and Febiger. 1915.

In the issue of the JOURNAL for May 20, 1915 (Vol. clxii, page 755), we reviewed Dr. Bainbridge's elaborate work on "The Cancer Problem." Dr. Taylor's volume presents a more compact study of the same problem, particularly from the clinical point of view, with reference to the diffusion of knowledge about the early signs and symptoms of the various forms of cancer and to the promotion of its early recognition and treatment. Emphasis is also placed upon the predisposing causes of cancer, that they may be avoided. At the conclusion of each chapter is a brief bibliography of references to important recent literature upon the subject concerned. The volume is hardly written for the laity but should prove of value and interest to the profession.

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THE RESPONSIBILITY FOR DIABETIC COMA.

DURING the past year our knowledge of diabetes has progressed in a remarkable manner. Science moves, not always slowly, but sometimes by leaps and bounds. Heretofore we have looked upon diabetes as a rather mysterious malady, condemning its victims to a rigid, almost penitential diet, with the alternative of a speedy demise, accompanied often by such adjuncts as carbuncle and gangrene, culminating in a fatal coma. The disease has been rather a nursing than a therapeutic problem.

From the work of Dr. Allen¹ and others, we are beginning to realize, however, that diabetes is amenable to treatment and that there is an avenue of intelligent attack available for the physician. He appears to have been the first to evolve the theory that part of the clinical picture of severe cases of diabetes might be due to a toxemia rather than to inanition, and following up

this theory, to try fasting, first on animals and later on human beings.

Although of course this method is too recent as yet to be dogmatic about it, the results seem promising so far. It should not, however, be a question of a very long time before we are able to see just how far this method surpasses the ordinary symptomatic and dietetic treatment, as the course of the disease under this latter method was sometimes comparatively short.

The distinctive feature of Dr. Allen's method is the length of the initial fast. In the October number of the *American Journal of Medical Sciences* he outlines his treatment. The initial fast, he says, must be lengthy enough to render the urine sugar-free, and is sometimes eight or ten days. After this preliminary ordeal, feeding is resumed gradually, and the patient's tolerance for carbohydrates, fats and protein determined. Routine fast days once a week are advisable. Alcohol may be given in small quantities, even during the initial fast. The danger signals of the fasting patient are vomiting and prostration. Dr. Allen has come to the conclusion that this treatment removes glycosuria and acidosis more quickly and surely than has been the experience heretofore.

In the same number of the above-quoted magazine is a confirmation of Dr. Allen's conclusions by Dr. E. P. Joslin,² who has found the treatment eminently successful in his own cases, and who believes that it can be carried out at home, provided the family and friends can be properly educated. Dr. Joslin suggests that the physician instruct the patient in the test for sugar and allow him to examine his urine from time to time, thus giving warning in time to save the patient from complications.

Certainly if patients are thus instructed, we should be able, theoretically at least, to prevent absolutely that dread denouement, diabetic coma. Of course there may be cases of rapidly developing diabetes, where the patient does not suspect that there is anything wrong with him, and, as he does not seek medical advice, may lapse into coma before his condition is suspected. But, given a patient who has sought treatment and been relieved of his glycosuria, we should consider it a reflection on the physician, supposing, of course, that the new treatment proves to be all that it promises, if any diabetic cases develop coma.

¹ The Treatment of Diabetes. By F. M. Allen, M.D. BOSTON MED. AND SURG. JOUR., 1915, Vol. 172, p. 241.

² Present-Day Treatment and Prognosis in Diabetes. By Elliott P. Joslin, M.D. Amer. Jour. of Med. Sci., October, 1915.

BOSTON CITY HOSPITAL ALUMNI
ASSOCIATION.

It is always of great value to any hospital to retain in after years the loyalty and interests of its alumni. Graduate house-officers and nurses, returning, from year to year, to the institution where they have received their most important training, not only thus keep in touch with progress in medical science and hospital administration, but bring back a new stimulus from the world without. Incidentally, becoming acquainted thus with the hospital's needs, they may be able to help, or to procure help, to meet these wants.

The Boston City Hospital, among others, is to be congratulated for the efficiency with which it has secured the interested loyalty of its former house-officers through the Alumni Association, and the Nurses' Club. The annual meetings of the Association have always been a source of pleasure to those who attend, and of mutual profit to them and the Hospital.

This year, the president of the Association, Dr. Robert W. Lovett, is making a definite effort to increase even further the value of this meeting to all concerned, and to give the Association an even wider function in promoting the interests of the Hospital.

"The first step toward such an expansion would naturally be in a better knowledge of the hospital, its work and its wants, and the program for this year will make a definite move in this direction. This matter is in charge of a committee of the staff working with Dr. Dowling, the superintendent.

"The meeting will be held on February 23, 1916. In the morning, exercises will be held at the hospital, consisting of talks on clinical subjects and accounts of progress in various lines. Operations will not form a prominent part of the program, but will probably be going on at the same time for those who wish to see them. The usual lunch will be held at the hospital at noon. In the early afternoon the newer parts of the hospital will be shown and the work presented by the administration, and probably certain scientific demonstrations will be presented, as well. Dinner will be at the usual time, and it is hoped that the after-dinner speakers invited may prove attractive.

"The society of the alumni has a function to perform, and was formed not only as a social organization, but to be of use to the hospital. The Executive Committee confidently looks for the coöperation of the majority of the members in helping it to make the Association a more active one and to show their willingness to aid by attending the dinner."

The JOURNAL takes cordial pleasure in extending to the City Hospital and to the Alumni Association its sincere good wishes, not only for the success of this meeting, but for the continued and increasingly helpful assistance and support of the Hospital by its graduates.

PERRIN, OF GRENOBLE.

Nor all the deeds of bravery are consummated in the heat and fury of actual conflict with the enemy, nor are all the heroes fighting men. Here and there among the vast, but unexploited army of physicians and nurses, there come to light stirring examples of heroism.

Now and then, casually and incidentally as it were, we hear a brief report of one of these heroes of the healing art,—a few lines only, more a tale of tireless effort and supreme self-sacrifice than of spectacular daring, and consequently less suited for the story-teller, but between them we may read, if we will, something of the deed behind. Such is the tale of Perrin, of Grenoble. He was a medical student at the University of Paris when the war broke out, and was to have received his degree the following year; but with the first call to arms he hastened to give his services to his country. In the year which followed he was mentioned in the army orders for bravery, and received the Military Medal and Cross. He also found himself a patient, with shell wounds in the legs. Nothing daunted, he had himself propped up in bed and wrote his doctor's thesis—it was on shell wounds, and Case No. 57 was himself! The thesis was accepted by the University, and as soon as he recovered he received his degree. In presenting it to him, President Landouzy recalled the interesting circumstance that his own grandfather had received the same degree under very similar conditions, except that at that time Paris was in the hands of her enemies.

BOSTON MEDICAL LIBRARY.

THE Fortieth Annual Report, presented at the annual meeting on January 11, 1916, gives many interesting facts relating to the progress of the Library. On account of the war, there was a great falling off in the number of foreign

books and journals received. Last year over \$3300 were expended for periodicals, but this year it was hard work to spend \$1700, in spite of adding eleven new subscriptions to the list. This came from the fact that seventy-six foreign journals were not received, having suspended publication, temporarily at least, and many others have appeared, straggling along at very infrequent and irregular intervals.

The Library has received during the year, from the bequest of the late Miss Ellen Brewer Wyman, of Newburyport, nearly \$70,000, half of the income to be used for the purchase of books and the other half for the binding of periodicals. This latter has been of great service in permitting the binding of a large number of periodicals which had been accumulating from lack of funds to bind them.

From the John M. Harlow estate have been received about \$3500, the income to be used for the purchase of books.

The income of the Library for the year was \$21,900, and there were expended for books \$2508, for periodicals \$1696, for binding \$2678, and for completion of files \$438.

The Librarian enumerated a long list of the notable accessions and gifts which had been received. Dr. J. B. Ayer gave two framed oil paintings by Darius Cobb of the site of the Library in 1881, showing a few miserable hovels and the water of the Back Bay coming up almost to them. Dr. E. P. Joslin presented to the Library last April the very valuable collection of works on diabetes which he had placed there on deposit several years ago. Mrs. J. H. Means donated the very complete library on color blindness which had belonged to her father, the late Dr. B. Joy Jeffries. Dr. W. D. Hall was the donor of a very large and valuable collection of ophthalmological journals. From Dr. F. H. Williams was received a book in wooden covers by Jacobus de Dondis Paduanus, *Aggregatio Medicamentorum*, Strassburg, Jean Mentelin, about 1470, the oldest printed book in the Library. Another valuable book acquired was a very handsomely bound copy of the work by Sir J. Fayrer on *The Thanatophidia*, a description of the venomous snakes of India, with medical details and experiments.

In the rooms recently vacated by the Directory for Nurses there have been placed steel stacks, with room for nearly 12,000 periodical volumes and theses. The former office of the Nurses' Directory has been fitted up as a room

for the Librarian, who has waited forty years for a place and a desk that he could call his own.

There were added to the Library during the year 3688 volumes, making a total of 89,963 volumes. The growth of the Library since its beginning in 1875 is shown in the following table, giving the figures at five-year intervals.

1876,	4488 volumes.
1881,	10,123 volumes.
1885,	15,162 volumes.
1890,	20,593 volumes.
1895,	26,082 volumes.
1899,	31,688 volumes.
1905,	45,194 volumes.
1910,	68,890 volumes.
1915,	85,963 volumes.

The Library still holds the fourth place in size in this country, being exceeded only by the Surgeon-General's Library of Washington, the College of Physicians of Philadelphia, and the New York Academy of Medicine.

There has, hitherto, been a great lack of uniformity among medical libraries in their methods of compiling statistics, and it has been impossible to know how to interpret figures given in the annual reports in many cases. To bring about a uniform system, a set of recommendations was adopted by the Medical Library Association at its meeting in Washington in May, 1915, following a paper by Mr. James F. Ballard, urging the adoption by all medical libraries of a uniform method of preparing statistics. The following are some of the details of the system advised:

"Everything of over 100 pages is a volume; everything of any size, if bound, is a volume; everything under 100 pages, if unbound, is a pamphlet. Duplicates are not to be counted, except second copies of books in general use and merged in the general library. Uncatalogued and unaccessioned material, merely estimated lots, also incomplete and unbound periodicals must not be included."

This system has always been in use by the Boston Medical Library in compiling its statistics.

After forty years of growth and service to the public, the Library finds that it has entirely outgrown the capacity of its bookstacks and its periodical room, and is greatly embarrassed in its endeavor to care for the books and journals

as they are received. Most of the money at its disposal is restricted in the purpose to which it can be used, so that none is available for a new stack-building. This is a capital opportunity for the friends of medical education to contribute to an institution which has proved its worth and offers its resources freely to the whole community.

THE TRUDEAU SCHOOL OF TUBERCULOSIS.

THE recent lamented death of Dr. Trudeau gives particular appropriateness to the notice, published in another column of this issue of the JOURNAL, of the establishment of a series of courses in the advanced study of tuberculosis in the Adirondack Cottage Sanatorium which he founded at Saranac Lake. These courses will be given there in the New York State Sanatorium at Raybrook and in association with the Saranac Laboratory and other neighboring hospitals and sanatoria. Courses will be of six weeks' duration and will cover all phases of the subject. Attention is called to this notice and to the importance of the opportunity which these courses offer for special advance study in this most important department of medicine. The announcement of the Trudeau School of Tuberculosis is encouraging evidence that the work so brilliantly founded by Dr. Trudeau will be adequately and progressively carried forward by his efficient successors.

MEDICAL NOTES.

PREVALENCE OF POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for January 7, 1916, states that during the month of November, 1915, there were in Virginia, sixteen cases of poliomyelitis, 43 of smallpox, and 378 of typhoid fever. During the same period there were 12 cases of poliomyelitis and 80 of typhoid fever in California; there were 171 cases of smallpox in Iowa and 138 of typhoid in Texas.

RELATIVE DEATH RATES FROM WAR AND FROM DISEASE.—The recently published 71st annual report of the New York Life Insurance Company shows that during the past year 409 of its policy holders were killed in battle, 448 by acci-

dents in civil life, while 707 died of cancer, 772 of pneumonia and 950 of tuberculosis.

THE TRUDEAU SCHOOL OF TUBERCULOSIS.—Recent advances in the knowledge of tuberculosis have created a demand for opportunities for special advanced study in this department of medicine. Such study requires institutions, laboratories, and other agencies devoted to the investigation and management of this disease.

In response to an extensive and increasing demand, and by the generous aid of public spirited persons, it has been decided to offer courses in the advanced study of tuberculosis at Saranac Lake in the Trudeau Sanatorium (Adirondack Cottage Sanitarium), founded by Dr. E. L. Trudeau in 1884, and the near-by New York State Sanatorium at Raybrook, and in association with the Saranac Laboratory, the Reception Hospital and the Sisters' Hospital at Saranac Lake, as well as the Stony Wold Sanatorium.

A six weeks' course will be offered covering all phases of the subject, including laboratory, clinical, and x-ray diagnosis, institutional organization, management and treatment, besides laboratory research.

The first session will be held from May 17, 1916, to June 27, 1916. Others will follow at convenient times. The fees for the course will be \$100, with an additional \$10 for laboratory expenses. It is expected that scholarships will be provided for a limited number of students. The total expenses, including board and lodging, will range from \$200 to \$250.

A prospectus and schedule of the course of study can be obtained from the Secretary, Saranac Lake, N. Y.

ELECTION OF DR. HUNT.—It is announced that Dr. Reid Hunt, professor of pharmacology at the Harvard Medical School, has been elected president of the American Society for Pharmacology and Experimental Therapeutics.

GRIP AND PNEUMONIA STILL CAUSING A HIGH DEATH RATE IN NEW YORK CITY.—During the past week 85 persons died of grip, as compared with 10 during the corresponding week of 1915. Since the mortality of grip *per se* is low, it is impossible to estimate the number of cases of this disease that occurred during the week. Since the number of deaths is eight times as numerous as during the corresponding week of last year, the number of cases was undoubtedly very large. Four hundred sixty-six persons died of bronchitis and pneumonia, as compared with 347 during the first week of 1915. Heart disease and nephritis show an increased mortality of 34. Undoubtedly, some of these deaths were hastened by "colds" recently contracted.

So far as grip, pneumonia and bronchitis are concerned, the following table, showing the deaths from these causes during the past four weeks, is of interest:

Deaths From	Week Ending Dec. 18	Dec. 25	Jan. 1	Jan. 8
Influenza	12	24	74	85
Bronchitis	18	36	29	25
Lobar pneumonia ...	185	251	272	293
Total	215	311	375	403

Viewed from the standpoint of age distribution, the deaths last week were more numerous during the later periods of life than during the earlier years. The total number of deaths reported during the week was 1880, giving a rate of 17.08, as compared with 1714 deaths reported during the corresponding week of 1915, with a rate of 16.01. The difference of 1.07 in the weekly rate is equivalent to an increase of 118 deaths.

INFANT MORTALITY IN ENGLAND.—A report of the health department of the county borough of Huddersfield, England, contains some interesting information regarding birth and infant mortality rates in that district. For the past fourteen years special efforts have been made to lower the infant mortality rate, with the result that in these years the rate was 30% lower than in the years 1877-1904. The measures in Huddersfield may be appreciated by the general statement that diarrhea is one of the minor causes of death, with equal figures in measles and whooping cough, while the major causes are premature birth, bronchitis, pneumonia and marasmus and debility, there being half as many deaths from the minor causes as from the three last-named major causes. There is in this active district the usual falling off in the birth rate, the actual number of births registered in 1912 being 600 less than it was in 1872, when the population was only seven-tenths as great. The rate, therefore, has greatly declined, being for the successive tenth years between 1872 and 1912, 37.5, 30.8, 23.3, 24 and 18.8. During the year 1914 the birth-rate kept on its downward way, touching the figure 18.08.

TYPHOID FEVER REDUCED IN RURAL COMMUNITIES.—Reduction in typhoid fever and improvement in sanitary conditions have followed the intensive investigations of rural communities, carried on by the United States Public Health Service in cooperation with local and state health officers, according to the annual report of the Surgeon-General of that Service. During the past fiscal year 16,369 rural homes in eight different states were visited and many of them revisited. In each of these homes information was obtained as to the prevalence of disease and insanitary conditions, and a complete sanitary survey of the premises conducted. This was followed by reinspections to determine if remedial measures had been instituted. In but a relatively small percentage of the cases did the persons concerned, after having their attention drawn to the danger of a particular unhygienic condition, fail to inaugurate corrective measures. Stimulus was given to the work by means

of public lectures, the formation of active sanitary organizations, and the enlisting of all public-spirited citizens in the campaigns for reform. Public buildings were also inspected and local authorities given expert advice in solving such sanitary problems as the disposal of excreta, the prevention of soil pollution, and the maintenance of pure water supplies.

The surveys made during the year 1914 had shown that in rural communities less than one per cent. of the homes had sanitary toilets and that more than fifty per cent. of the people were using water from polluted sources. This condition, according to the Public Health Service, made the rural sanitation question loom large among the matters vitally affecting the welfare of the nation. Following these studies and as a result of the interest aroused, the typhoid fever rate, an excellent indicator of the sanitary status of a community, has in some places frequently been cut to one-quarter of its previous figure. In Berkeley County, West Virginia, the cases of typhoid fever were reduced from 249 to 40 in one year. In Orange County, North Carolina, the rural sanitation campaign resulted in a reduction of the cases from 59 to 17.

The tangible results of operations in rural sanitation indicate that marked advancement in maintaining hygienic and satisfactory surroundings in country districts is possible by the application of the common principles of preventive medicine. Insanitary conditions exist largely because they are not known to be such. Actual demonstrations of their harmfulness, together with definite recommendations for their correction, remain one of the most gratifying and successful methods for instituting reforms, and have been, in the experience of the Public Health Service, invariably accompanied by definite and measurable results.

EUROPEAN WAR NOTES.

CASUALTIES AMONG GERMAN MEDICAL OFFICERS.—Report from Budapest, Hungary, on January 14 states that during the period from August 1, 1914, to November 1, 1915, 373 German army surgeons were wounded, 96 killed on the field of battle, 707 died of infectious diseases, chiefly Asiatic cholera and typhus fever, and 315 were taken prisoners. Of Austrian army surgeons, 315 were wounded, 101 killed, 971 died of infectious diseases, and 331 were taken prisoners.

NEED OF SERBIAN RELIEF.—The Serbian Relief Fund Committee has recently issued the following appeal, describing the need for relief in Serbia and urging contributions to its fund for that purpose:

"Thousands of Serbian refugees are homeless in Greece; other thousands have been driven into the mountains of Albania and Montenegro. Those Serbian women and children who did not flee before the invasion are undergoing great

privation and suffering in the conquered territory. We are again asking for contributions for the relief of Serbia—this time to save the Serbian refugees. We also desire to render an account of our stewardship and inform you on the situation.

"Dr. Edward Stuart is distributing relief from Salonica, and to this work we have contributed \$25,000, of which \$10,000 cash was cabled to him as an emergency fund and the balance expended for supplies, partly now on the way and partly, we believe, already delivered, having been purchased and shipped from England when cargo space could not be secured in this country. For the relief of the refugees in Albania and Montenegro a most efficient American committee has been formed in Rome, including Ambassador Thomas Nelson Page, Dr. Edward W. Ryan, (Red Cross), Mr. F. C. Wolcott (Rockefeller Foundation), and Mr. H. O. Beatty (War Relief Clearing House). This American committee is shipping supplies from Italy to Albania, and distributing them to the Serbian refugees. To this work we have contributed \$16,500.

"Mr. Herbert C. Hoover is negotiating with the German-Austrian Governments and those of the Entente Allies for relief to be sent into Serbia itself under conditions which will guarantee that, as in Belgium, supplies will not be appropriated by the invading armies. It is expected that arrangements for this work will soon be completed.

"The above expenditures, added to the expenditures for supplies last spring and \$6000 to assist the work of Dr. Strong have exhausted the \$60,000 so liberally contributed by the people of New England. In all our expenditures for relief we have been in active coöperation with the Rockefeller Foundation, War Relief Clearing House, Serbian Relief Committee of New York, Serbian Relief Committee of London, and the American Red Cross. We have thus been enabled not only to ship supplies promptly both from New York and London in response to the great emergency that arose when it was difficult to obtain cargo space, but also to obtain all the information available regarding the complicated situation through the various agents of these organizations in Serbia and Greece, assisted by the State Department at Washington. The difficulties of getting relief to Serbia have been great, but we believe that through coöperation we have been able to meet them promptly and give substantial help.

"We now appeal for more money—much more money. No contribution will be too small to do good; none can be so large as to make other contributions unnecessary."

WAR RELIEF FUNDS.—On January 22 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund.....	\$91,350.50
Serbian Fund.....	62,660.69
Allied Fund.....	52,506.80
French Wounded Fund....	41,553.59
Armenian Fund.....	29,131.37
Surgical Dressings Fund....	17,297.00
La Fayette Fund.....	16,687.99
Polish Fund.....	16,320.48
French Orphans' Fund....	15,997.10
Italian Fund.....	14,963.55
French Refugees' Fund....	4,890.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending January 22, there were 330 deaths reported, with a rate of 22.63 per 1,000 population as compared with 231 and a rate of 16.09 for the corresponding week of last year. There were 11 deaths from influenza, and deaths from pneumonia numbered 70 against 30 last year.

There were 37 deaths under one year as compared with 40 last year, and 118 deaths over 60 years against 71 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 54; scarlet fever, 82; measles, 71; whooping cough, 49; typhoid fever, 1, and pulmonary tuberculosis, 49.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 11, and tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 3; measles, 2; whooping cough, 8, and tuberculosis, 28.

BAPTIST HOSPITAL.—The annual graduation exercises of the New England Baptist Hospital Training School for Nurses were held in Boston on January 19, under the presidency of Dr. George S. C. Badger. The principal address was by Dr. Charles A. Porter on his experiences with the second Harvard Unit in France. Diplomas were presented to a class of ten pupil candidates.

LEPROSY CARE IN MASSACHUSETTS.—In a recent address before the Lowell Institute, Dr. Richard P. Strong commented on the inadequate care of lepers in this state, comparing it with the efforts of the Government in the Philippines, whose establishment of a colony for the segregation and treatment of lepers was referred to in a recent issue of this JOURNAL. That the state has been very reluctant to make sufficient appropriations for the better care and housing of its lepers has been previously commented on in this JOURNAL, and it is especially deplorable in view of the recent efforts being made by Dr. J. A. Honeij in the investigation and treatment

of the disease, and the word of so unquestionable authority as Dr. Strong should be of influence in renewed efforts to establish on Penikese Island a colony where victims of the malady may live in comfort and receive adequate care and treatment.

A NEW BUILDING PLANNED FOR THE MASSACHUSETTS COLLEGE OF PHARMACY.—The Massachusetts College of Pharmacy is actively planning for a new building to be erected on the site purchased a few years ago at the corner of Brookline and Longwood Avenues, Boston, very near the new buildings of the Harvard Medical School and in the great center of medical education and practice that is being developed in this part of Boston. In the immediate neighborhood are the Brigham Hospitals, the Children's Hospital, Harvard Dental School, Tufts Medical and Dental Schools, the Psychopathic Hospital, and the Huntington Cancer Hospital, the Carnegie Nutrition Laboratory and many other institutions of a similar nature.

The building is to be of an impressive character that will add much in the eyes of the general public to the dignity of the profession of pharmacy. The first floor is to be at ground level and will contain the chemistry and pharmacy laboratories, with apparatus rooms and instructors' rooms, a large study-room for men students, and also the heating plant and janitor's work shop. The middle or main floor will contain two lecture rooms, each with about 300 seats, the trustees' room, general offices, library, women's study-room and rooms for the professors. The upper floor will contain the materia medica laboratory with its stock room, the bacteriology laboratory, recitation rooms, alumni room and various other rooms of varying size and importance. In the central portion of the upper floor a large assembly room is to be included, with a capacity of five hundred, a stage at one end and store rooms adjoining. This room may be used for conventions, receptions and other social purposes, and for the commencement exercises of the College.

This College is in possession of an endowment amounting to two hundred and forty thousand dollars, but no part of the principal of this is to be used. The new building with its equipment, exclusive of its site, will cost in the neighborhood of two hundred thousand dollars, of which a part is to be obtained by the sale of the present building and its site, and a part is being raised by a campaign now under way. It may be necessary to put a mortgage on the building for a part of its cost, but it is hoped that this will be small in amount.

BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.—The annual meeting of the Boston Society for Medical Improvement was held at the Medical Library on January 24, at 8.15 p.m. Dr.

L. H. Newburgh spoke on "Experimental Work in Pneumonia." The annual business meeting was held at 9 p.m., and the following officers were elected: President, Dr. Herman F. Vickery; secretary and treasurer, Dr. George G. Smith; members of prudential committee, Dr. C. F. Painter, Dr. D. F. Jones and Dr. J. J. Putnam.

BRATTLEBORO MUTUAL AID ASSOCIATION.—The eighth annual report of the Brattleboro (Vt.) Mutual Aid Association is a record of laudable efforts on the part of generous spirited women of that city to provide for the community assistance in sickness not offered by the hospitals, visiting nurses or by unorganized private nursing. Their activities include the services of a graduate nurse, who supervises a group of attendants. These attendants are trained to care for the sick, and do housework when desirable. They, of course, do not take charge of cases requiring skilled care. In these cases trained nurses can be supplied. But for families of small means, desiring assistance at special times, their services are helpful and inexpensive. In addition to this nurses are supplied for maternity cases, and efforts are made toward pregnancy care and instruction given in the care of the baby after the maternity nurse has left.

The activities of the Association also include the services of a school nurse and the management of a vacation house in Niantic, Conn.

THE HATHERLY MEDICAL CLUB.—The tenth anniversary of the Hatherly Medical Club was held on January 12 at the home of Dr. Walter P. Hutchinson. Dr. Gilman Osgood of Rockland spoke. The officers elected for the coming year were: Dr. C. E. Knight of Rockland, president; Dr. R. B. Rand of North Abington, vice-president; Dr. G. E. Hammond of Hanover, secretary; and treasurer, Dr. Wheatley of North Abington.

HOSPITAL BEQUESTS.—By the will of the late Joseph H. Baker of Beverly, the Beverly Hospital has been given \$500 and the New England Industrial School for Deaf Mutes \$300.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.—The annual meeting of the Massachusetts Association of Boards of Health is to be held in Boston on Thursday, Jan. 27. The first speaker will be Dr. Milton J. Rosenau of Brookline, on "The Causes and Modes of Diffusion of Influenza and Pneumonia," and this subject will be discussed by Dr. Francis X. Mahoney of Boston, Dr. James C. Coffey of Worcester and Dr. Charles B. Chapin of Providence, R. I. At the afternoon session there will be addresses by Mr. Robert N. Hoit of Wellesley on the "Standard-

ization of Local Health Regulations," and by Mr. Seymour H. Stone of Boston on "The Incurable Consumptive."

AESCULAPIAN MIDWINTER MEETING.—The eleventh annual midwinter meeting of the Aesculapian Club of Boston was held at the Harvard Club on Saturday evening, January 8, 1916, at 9 p.m. One hundred members and 150 invited guests were present. The principal address was by Major Noble of the United States Army Medical Corps, who spoke of the great inadequacy of the present medical corps of the United States Army and Navy, and illustrated by figures and comparisons from the Civil War and present European conflict. He outlined the needs of the service and functions which should be fulfilled by civil physicians. He emphasized the need of filling the United States Medical Reserve Corps to its fullest capacity and referred to the course on military medicine which is to be given at the Harvard Medical School by Major Chamberlain.

WORK OF WORCESTER BACTERIOLOGICAL LABORATORY.—The Health Department announces to the physicians of Worcester that its Bacteriological Laboratory, after January 1, 1916, will be prepared to do the Wassermann test for syphilis and the so-called complement-fixation test for gonorrhea. This gonorrheal test is especially for the more hidden manifestations of this disease, such as "rheumatism," pyosalpingitis, etc.

These tests and the outfits for collecting the specimens will be furnished free of charge to physicians of Worcester. The tests will be made on Tuesdays and Fridays at the City Hospital laboratory, under the supervision of Dr. F. H. Baker, bacteriologist, and Dr. E. B. Bigelow, assistant bacteriologist, of this Department.

The history blank accompanying the outfit must be filled out completely with the exception that for name and address letters or numbers may be substituted.

It is to be distinctly understood that these examinations are only for bona fide residents of Worcester.

The Bacteriological Laboratory was opened August 1, 1894, and below is a list of diseases in which diagnostic work is undertaken, with the date of its inception.

- 1894 Diphtheria
- 1902 Tuberculosis
- 1908 Typhoid Fever
- 1908 Malaria
- 1916 Syphilis
- 1916 Gonorrhoea

The Laboratory has examined in all about 80,000 specimens.

Obituary.

DAVID WILLIAMS CHEEVER, M.D.

DAVID WILLIAMS CHEEVER, A.B., M.D., LL.D. (Harv.), was born in Portsmouth, N. H., November 30, 1831, and died in Boston, December 27, 1915, aged 84. He was the son of Dr. Charles Augustus and Adeline (Haven) Cheever, and the grandson of Dr. Abijah Cheever. He was a lineal descendant in the seventh generation from Ezekiel Cheever, who came from Canterbury, England, in 1637, was the first master of the Boston Latin School and eminent as a teacher for 70 years. Of the seven generations, four were graduated at Harvard and five were professional men.

Dr. Cheever graduated from Harvard in 1852 and from the Harvard Medical School in 1858. He at once began practice in Boston and continued therein for 56 years. In the early years of his professional life he saw a variety of service. He wrote for the *Atlantic Monthly* and the *North American Review*, and many papers for the medical journals. He was editor of the *BOSTON MEDICAL AND SURGICAL JOURNAL* a year and had charge of a hospital for smallpox for a time. He was acting assistant surgeon in the Judiciary Square Hospital, in Washington, for two months in 1862.

When Dr. Cheever began practice there were no specialists. All were general practitioners, a few paying more or less attention to surgery. In ten years the subject of this sketch had built up a large practice, including obstetrics. Heredity and other influences led him to pay especial attention to surgery. His grandfather was a surgeon in the Revolution and his father did the surgery in his vicinity. Doubtless the doctor's philosophical mind had most to do in his choice of a specialty. As he has well said, surgery is plain work compared to medicine, and is more to be seen. The course of his life is more substantial and hence the vocation is more substantial.

Dr. Cheever's appointment as assistant anatomist at the Harvard Medical School in 1860, and that of surgeon at the Boston City Hospital upon its inauguration in 1864, gave him ample opportunities to fit himself for his brilliant career as a surgeon. His work at the Hospital and his teaching at the Harvard Medical School continued all his active professional life. In 1868 he was appointed adjunct professor of clinical surgery, professor of clinical surgery in 1875, professor of surgery in 1882, and professor emeritus in 1893. At this time he was made surgeon emeritus at the City Hospital.

In his opinion it was the duty of those holding hospital appointments "to give personal oversight to their patients, to teach, to write, to publish, to support and harmonize the staff, the trustees, the administration." He did all this and more. His sound judgment and wise counsel were always at the service of his fellows. As

a teacher he was clear, concise and practical. "Predigestion, terseness and extemporaneous speaking," in his opinion, were the chief factors of his success in teaching.

Aside from his "Lectures on Surgery," dedicated to 33 classes that had received his instruction, and five volumes of Medical and Surgical Reports of the Boston City Hospital, which he edited and for the publication of which he was chiefly responsible, he wrote and published more than sixty papers and addresses relating generally to professional topics.

Of his many miscellaneous papers, attention may be called to the following: Variola: The value and fallacy of statistics in the observation of disease (a Boylston prize essay, 1860, of lasting interest); Radical cures of hernia; Natural labor in phthisis; Leucocythemic tumors; Spontaneous fractures; Obstruction of the bowels; Dangers from anesthesia; Is the study of medicine a liberal education?; Medicine as a trade and as a profession; Shattuck Lecture on the new surgery; Does medicine advance?; Evolution checked; Mental condition before operation; Privileged medical communication; The ideal doctor; Medicine and religion; Reminiscences of his professional life; and several others that will appear later. The character of his writings, however, is of far more importance than their number. As many of them have a lasting interest and value, it is to be hoped that a collection of them in a convenient form may be available in the near future.

For many years Dr. Cheever was a leader in the surgical world. He was deliberate and careful in diagnosis and treatment, bold in emergencies, thorough in his operations, and most assiduous in the after-care of his patients, their welfare taking precedence of everything else. His hospital patients were treated with the same consideration as his private patients,—kindly, thoughtful, painstaking. In his practice and in his teachings he insisted upon the importance of paying personal attention to details. Nothing escaped his notice. When possible, he kept his patients in bed a few days prior to subjecting them to a serious operation. After the operation was performed, he usually applied the dressings himself and often saw his patients placed comfortably in bed. He usually saw them a few hours later to assure himself that all was going well. Furthermore, his interest did not cease with the operation; the after-care was most faithful and efficient. The important details of his serious cases were never forgotten, thus serving as a sure foundation of his sound judgment.

The doctor performed many original, or unusual operations, such as esophagotomy (6 cases) for foreign bodies; the first Caesarean section in this vicinity; depression and replacing the upper jaw for the removal of pharyngeal tumors; removal of malignant tonsils through an external incision; Cock's operation for perineal section; excision of hip; removal

of the Gasserian ganglion for inveterate neuralgia; Wood's operation for the radical cure of hernia; transfusion, etc. He reported over 1200 major hospital operations, with a recovery of 85%, a wonderful record considering the character of the cases and the risks of surgery in those days,—mainly pre-aseptic,—when sepsis, erysipelas, pyemia, etc., were rife and practically all wounds suppurated.

Medical charity always interested the doctor, as he devoted no small portion of his active life to its service both in hospital and in private practice. He was emphatic in his opinion that the well-to-do in our hospitals should pay for the professional services received therein. The staff willingly cares for the poor without fees, but it is unjust to ask them to give their services to the rich upon the same conditions, as is the custom in some of our institutions.

Upon the occasion of receiving a loving cup from the staff of the City Hospital some years ago, Dr. Cheever spoke as follows: "In private life and in public life I can honestly say that I have tried to advance our profession. I have given whatever I could afford to give away solely to medical purposes and objects: the School, the Hospital, the Medical Library, the Medical Benevolent Society. The welfare of my medical brethren has been in my thoughts prominently and permanently." Every one at all familiar with his life can attest the truth of these statements. His life was consistent therewith.

Many years ago he established a scholarship in the Harvard Medical School for the benefit of first-year students, the first one of that order in the school, all the others being for the advanced classes. He also established a fund at the City Hospital for the purpose of presenting a case of surgical instruments to each graduate of the surgical department of that institution. While, as a rule, his charities were not large, yet they were numerous. As might be expected, they were judicious. He gave unfailing interest and help to the needs of many individuals who came to his knowledge.

Dr. Cheever belonged to several associations, chiefly medical, at which he was a constant attendant, frequently speaking and presenting papers. He had been president of the American Surgical Association, Massachusetts Medical Society, Boston Medical Library and the Massachusetts Medical Benevolent Society. He was Associate Fellow of the College of Physicians of Philadelphia, Hon. Fellow of the American College of Surgeons, Hon. Mem. N. H. Medical Society, and Associate Member of the Surgical Society of Paris. He was an Overseer of Harvard University twelve years. He was trustee of Mt. Auburn Cemetery for the same period. He took much interest in cremation and was consistent therein. It was established during his service there. He was a member of St. Botolph and Boston Athletic Clubs. He be-

longed to what was known as the "old men's class in gymnastics" at the latter, and for 17 years, when in town, attended it regularly five days in the week! The doctor was always much interested in the Latin classics, having received a thorough drill therein in his youth, and reading them readily in the original. His favorite English novelist was Thackeray. Of late years he had spent as much time as possible in the open air, riding horseback, walking and supervising his farm in Dedham, in which he took the greatest interest. His long life was due in no slight degree to his calm temperament, his philosophical mind, his sensible habits, and the wise regulation of his daily activities. Many might well learn a lesson therefrom.

In 1861 Dr. Cheever married Miss Annie C., daughter of Thaddeus and Sarah (Chamberlain) Nichols of Boston, who survives him, as do four of the six children: Dr. David Cheever of the Harvard Medical School and of the surgical staff of the Peter Bent Brigham Hospital, now in charge of the second Harvard Unit at a British hospital in France; Adeline, wife of Dr. George S. Whiteside of Portland, Oregon, and Misses Alice and Helen Cheever of Boston, the latter well known for her interest in charitable work in this vicinity.

The prominent features of Dr. Cheever's life were character and service. His ideals were sane and noble, his tastes refined, his standards were high, and his daily life consistent therewith. He was truth and justice personified. His devotion to duty was limited only by his time and strength. Swayed less by impulse than most men, his judgment was sound and his advice dependable. He was a tower of strength and comfort in time of trouble. Kindly in his feelings, lenient in his criticism, just in his estimates of people, he was ready at all times to help his fellow men. For half a century he has been a guide and an inspiration to his fellows. His life has been a benison to his family, to his patients and to his friends. A fine type of man, a public spirited citizen, an eminent surgeon, an honor to his profession and to his alma mater, an occupant of many important positions and never found wanting, he will be missed in the community, and the void in the hearts of his family and his friends will never be filled.

GEORGE W. GAY, M.D.

SUMNER EDWARDS, M.D.

The death of SUMNER EDWARDS, which occurred on January 6, 1916, ended suddenly a life of much promise. Edwards was twenty-six years of age and so just entering upon his life's work when the summons came. After spending his boyhood in Bethel, Maine, he entered Bowdoin College for his collegiate training. There he entered very keenly into the college life; he

was a member of the Theta Delta Chi fraternity; he was prominent in track athletics, and in his senior year he was president of his class. He was an excellent student, as shown by his election to the Phi Beta Kappa. He graduated from Bowdoin in 1910 with the A.B. degree. He then spent a year at Hebron Academy, Maine, before entering upon the study of medicine at Harvard. At Harvard, as at Bowdoin, he was active in the student life, being a member of the Innominate, Aesculapian and Boylston Societies and the Phi Rho Sigma Fraternity, and one year president of his class. He graduated in 1915, receiving the M.D. degree *cum laude*. In a competitive examination in January, 1915, he won a place as medical house-officer at the Peter Bent Brigham Hospital. About the middle of October, 1915, he came on duty for this work.

In his term at the hospital he was efficient, doing his work exceedingly well. His bearing was modest; he was pleasant in his relations to all of his associates on the hospital staff and to the patients, and so he came to be greatly liked by all in the hospital. His illness began, as did many of the cases of the recent epidemic of grippe, with a high fever and great prostration. In a few days lobar pneumonia developed in one lower lobe of his lung and shortly the other lower lobe became involved. The infecting organism was type No. 1 pneumococcus and from the early days of his illness he was very sick. His illness and death cast gloom over the entire institution. The medical staff has lost a very well liked member whose presence will be missed for a long time to come.

On January ninth his funeral services were held in his old home at Bethel, Maine, and he was buried in the cemetery on a low knoll by the river with a distant view of that lovely range of hills which he doubtless loved to look upon when at Bethel.

At a recent meeting of the governing board of the Peter Bent Brigham Hospital the following resolution was adopted:

"The Board of Incorporators learns with deep regret of the death of Dr. Sumner Edwards, House Officer of the Peter Bent Brigham Hospital.

"We deplore the loss to the hospital of his efficient and faithful services, and realize that still greater is the ultimate loss of a man of his promise to his profession and the public. We offer our deep sympathy to his mother."

HENRY A. CHRISTIAN.

JOSEPH HENDLEY TOWNSEND, M.D.

DR. JOSEPH HENDLEY TOWNSEND, for the past ten years secretary of the Connecticut State Board of Health and a prominent physician of New Haven, died at his home in that city on January 7 of influenza, culminating in pneu-

monia and cardiac failure. He was born in New Haven on January 18, 1862, and received the degree of A.B. from Yale in 1885 and that of M.D. in 1887. After serving two years as an interne at the New Haven Hospital, he settled in the practice of his profession in that city. He was surgeon of the Second Regiment of the Connecticut National Guard and later became chief surgeon of the State Militia, with a rank of Major.

In 1901, Dr. Townsend was appointed to the Connecticut State Board of Health, and became its secretary in 1906, a service which constitutes his most valuable contribution to the interests of public health. He was a member of the American Public Health Association, the Association of Military Surgeons of the United States, and was treasurer of the Connecticut Medical Society and president of the New Haven Medical Association and the New Haven County Association.

In 1891 Dr. Townsend was appointed assistant in clinical medicine at the Yale Medical School, where he became demonstrator of obstetrics in 1892 and lecturer on hygiene in 1894. He was the author of many contributions to medical literature and for ten years had edited the monthly bulletin of the Connecticut State Board of Health. He is survived by his widow.

Miscellany.

NOTICE.

MASSACHUSETTS SCHOOL FOR HEALTH OFFICERS.

Special Lectures in February.

All lectures will be given from five to six o'clock on the dates specified and in the amphitheatre of Building E. of the Harvard Medical School, unless otherwise indicated. All lectures will begin promptly on the hour.

February 1. "Sanitary Law." Prof. Eugene Wambaugh, Harvard Law School.

February 2. "Tuberculosis" (6 lectures). Dr. John B. Hawes, 2d, Secretary Board of Trustees, Massachusetts Hospital for Consumptives.

February 3. †"Mental Hygiene" (6 lectures). Dr. E. E. Southard (and assistants), Director Psychopathic Hospital, Boston.

February 4. "Personal Hygiene" (6 lectures). Prof. W. B. Cannon, Professor of Physiology, Harvard Medical School.

February 8. "Sanitary Law." Prof. Eugene Wambaugh.

February 9. "Personal Hygiene." Prof. W. B. Cannon.

February 10. †"Mental Hygiene." Dr. E. E. Southard and assistants.

February 11. "Tuberculosis." Dr. John B. Hawes, 2d.

February 14. "Tuberculosis." Dr. John B. Hawes, 2d.

February 15. "Sanitary Law." Prof. Eugene Wambaugh.

February 16. "Personal Hygiene." Prof. W. B. Cannon.

February 17. †"Mental Hygiene." Dr. E. E. Southard and assistants.

February 18. "Tuberculosis." Dr. John B. Hawes, 2d.

February 23. "Personal Hygiene." Prof. W. B. Cannon.

February 24. †"Mental Hygiene." Dr. E. E. Southard and assistants.

February 25. "Tuberculosis." Dr. John B. Hawes, 2d.

February 29. "Tuberculosis." Dr. John B. Hawes, 2d.

* Series continued from January course.

† Lecture will be given at the Psychopathic Hospital, 74 Fenwood Road, Boston.

SOCIETY NOTICES.

HARVARD MEDICAL SOCIETY.—There will be a historical club meeting in the Peter Bent Brigham Hospital amphitheatre on Tuesday evening, February 1, 1916. Program: "Leonardo da Vinci's Researches in the Circulatory and Nervous Systems." Dr. Arnold C. Klebs, Washington, D. C. Medical students and physicians are cordially invited to attend.

ERNEST G. GRAY, *Secretary*.

MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS.—The Massachusetts Society of Examining Physicians will hold its annual meeting at the Boston City Club, January 26, 1916, at 8.00 P.M.

Gastric and Duodenal Ulcer.

1. Etiology and Physiology Dr. Franklin J. White

2. Surgical Treatment Dr. William M. Conant

3. Intra-abdominal Pressure Dr. Walter B. Cannon

4. Roentgenological Diagnosis (Screen)

Dr. Walter J. Dodd and Dr. Atrial W. George

5. Analysis of City Hospital Cases for Ten Years

Dr. Irving J. Walker

Election of officers.

JAMES H. STEVENS, M.D., *Secretary*.

BOSTON PSYCHOPATHIC HOSPITAL.—The fifth "Authors' Evening" of ten papers, A Contribution to the Management of the Speech Disorder Problem in the Public Schools (Results of a speech defect survey in 20 cities) by Walter B. Swift, M.D., and assistants, C. A. Osborne, M.D., Ph.D., Second Assistant, Miss Jennie Hedrick, Once Voluntary Assistant, and Miss Grace T. Brown, will be held at the Voice Clinic, Psychopathic Hospital, 74 Fenwood Road, Brookline, Mass., January 28, 1916, at 8.00 P.M.

Introduction: The Scope of the Survey.

1. Report of Speech Defects in Rochester, N. Y.

2. Data on Speech Improvement from Western

Cities.

3. Approaching the Speech Problem in the Middle South.

4. What Eastern Cities are Doing in Speech Defects.

5. A Note on the Speech Problem in Washington, D. C.

6. Report on Speech Possibilities in Springfield and Worcester.

7. Why New York Stands First in Treating Speech Disorder.

8. Causes for Inefficient Results in Speech Work.

9. The Speech Problem as a Preventative of Crime and Prostitution.

10. Problems and Possibilities of Prevention of Speech Disorder.

Physicians and medical students invited. If you expect to attend, mail a postal to 110 Bay State Road, Boston.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER (BOSTON COMMITTEE).—A meeting will be held on Saturday, January 29, at 4.00 P.M., at the Boston Medical Library, to discuss further measures which may be employed for the instruction of the public in regard to cancer. To this meeting public health officers from many quarters of the State have been invited.

Speakers: Dr. Francis Carter Wood of the Crocker Research Fund, New York; Dr. Eugene R. Kelley of the Massachusetts State Board of Health, and Dr. Edward Reynolds of Boston.

The medical profession is invited.

The Boston Medical and Surgical Journal

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Memorial.

MEMORIAL OF MISS KATHARINE BURRAGE.

BY JAMES J. PUTNAM, M.D., BOSTON,

Emeritus Professor of Neurology in Harvard University.

PROGRESS in social service work has always been, and always will be, the expression and outcome, not only of good plans, but also of the devoted labor of good people. Such a person was Miss Katharine Burrage, through whose unselfish care, intelligence and industry the interesting enterprise which is here outlined was made possible. The memory both of the worker and the work are worthy of preservation, for both of them have been sources of inspiration.

The enterprise referred to was the establishment of a class in pottery-making in connection with the Out-Patient Department of the Massachusetts General Hospital. The class was in active operation during the five years from 1908 to 1913, and is still being carried on at the North Bennet Street Industrial School, at the desire of the members, partly as an expression of their appreciation of its intrinsic value and partly as a tribute of affection to Miss Burrage.

Occupations of this sort have long been utilized as an aid to treatment, and the experience of Dr. Herbert J. Hall of Marblehead, with its results interesting alike from the therapeutic and technical standpoint, is familiar to all stu-

dents of such matters. So far as the writer is aware, however, no such opportunities had been extended to patients attending the dispensary departments of a large hospital, where, as a rule, the rush of getting through the morning's work leaves the medical staff with little time to think of anything beyond the more urgent needs of the patients applying to them for help. With the establishment of the Social Service Department, however, and its rapid progress in efficiency, the therapeutic outlook at the Massachusetts General Hospital became greatly widened, and modes of treatment and modes of appeal hitherto not thought of, became the order of the day. The fourth, fifth, and sixth annual reports of this department give good accounts of the pottery class and its workings, and these accounts are followed in the present sketch.

It should be remembered that the class was organized distinctly in the interests of patients with nervous symptoms and disabilities. What we felt to be most needed was that the women and girls with these nervous symptoms should be given a new interest and a chance to develop their skill in a new direction, and, more than all, that their sense of mutual helpfulness and forbearance should be given an opportunity to expand.

The class met and worked for two-hour periods twice a week in a room furnished by the Hospital. The number of persons present at the meetings varied considerably, as was natural in consideration of the fact that all had their own home tasks to do; but the class membership increased gradually from 13 to 32. An important

outcome was that the class came to be regarded as a group of persons ready to receive intellectual and moral stimulus, from whatever source it might arrive. It was in consequence of the recognition of this fact by interested friends outside the department that the opportunity came to the members to attend certain lectures at the Boston Art Museum, given by Miss Alicia Keyes, and arranged exclusively for them. These lectures were given during two successive years, each course consisting of about six lectures. Moreover, there were two successive summers when the class was invited to spend two weeks at one or another pleasant place in the country, Miss Burleigh or another member of the department accompanying the group.

The following quotations from the Report of 1910 not only show the progress of the class in the respects hinted at above, but also indicate Miss Burrage's share in bringing about these results, for it was clear to interested onlookers that it was to her influence that the good results were largely due.

The Report of 1910 says:—

"The friendly feeling among the women has increased greatly; they visit each other at home and some real friendships have resulted. A visitor would not think it a gathering of invalids if he heard the cheerful voices. One newcomer thought at her first meeting that she was the only sick one there. One woman who was too much of an invalid to get her own breakfast has been so much encouraged by the others that she is now keeping house and doing her own work. . . .

"It has been gratifying to the teacher, Miss Burrage, to find that taste changes with character. There has been a marked improvement in the designs modeled, some of them being really beautiful. One woman who joined the class, half-heartedly, came to the conclusion that she was not 'playing fair' when she did not come regularly and try to work. Though she was one of the initial members of the class she had done practically nothing the first eight months. She then took hold with a will, developed real talent, took clay home with her, and now rarely comes to a meeting without some dainty thing she has made at home. . . .

"As an experiment we admitted to the class one patient who had been in Danvers' Insane Hospital and who was at home on an extended visit. Most of the class were previously told of her troubles, but at first she bothered some of them a good deal by talking about seeing faces in her sleeves and by getting quite excited when she spoke of the hospital at Danvers. It was finally left to the class to decide whether she should be permitted to remain, and they all declared in her favor. Gradually she has grown more at home; she now enters into the spirit of the class, has become devoted to Miss Burrage and has gained in every way.

"The class has served another purpose. In dealing with a patient we get very near to her in certain respects, but she shows quite another side of her character to Miss Burrage. Through this additional knowledge we get a much bigger view of the patient. For instance, Miss Burrage gets a much better idea of the patients' home life from what they say as they talk together than they are able to

give (me) when they try to describe it. The unconscious pictures are by far the best and most trustworthy."

Miss Burrage was born in Lowell and began the study of clay-modeling in the Textile School of her native city in 1899. In 1905 she came to the North Bennet Street Industrial School, and remained connected with that institution, in one way or another, through the rest of her life. In 1912 she was appointed instructor of the modeling classes in the Boston public and evening schools. Her connection with the Massachusetts General Hospital began in 1908.

The reasons above given for the organization of the class at the hospital appealed very strongly to Miss Burrage from the beginning. She was not only a teacher of clay-modeling, but was ever a friend in the best sense to all those with whom she came in contact,—the more so if she felt that they had traits and talents which it lay within her power to stimulate. Under her instruction of the class at the Massachusetts General Hospital, technical success was systematically subordinated to the development of individual power, taste, and character. She could never have worked whole heartedly on any other plan, and if she had tried to do so it would have been at the sacrifice of an essential element in her principles and in her influence upon others. She recognized at once that the kinds of talents which the members of the class exhibited varied considerably in correspondence with the various dispositions. Some of the workers were small of stature, thin-faced, finical in temperament; others were large in stature, big-hearted, capable of flying into passions and of getting quickly over them. The same characteristics were seen in the pieces that they produced, and the recognition of these facts enabled Miss Burrage to understand her pupils better, and indirectly to help them to modify their defects. The different members of the class came, of course, to lean upon her, in one sense, but all her efforts were devoted to making them independent, and they all gained in this respect.

After the class had been in full operation for some time, Dr. Robert B. Osgood, one of the orthopedic surgeons of the Hospital, made it possible for the patients in the orthopedic ward to take advantage of the teaching, and a young girl who had been a prominent member of Miss Burrage's class became their teacher.

The year before Miss Burrage died, the hospital authorities decided to start a department of their own, conducted not on the plans indicated above, but rather for the purpose of giving employment to the handicapped patients and finding a real market. As a consequence of the introduction of this plan, the pottery class could no longer continue its work at the hospital. But Miss Burrage's interest in the enterprise which she had had so much at heart outlived this check. Determined as she was to make the undertaking a success, she had been in the habit

for some time of carrying the pieces of unbaked pottery to the North Bennet Street Industrial School, where they were glazed and fired. Now she proposed to transfer the entire class there, where the generosity of the directors offered a new home, and to carry on the teaching without charge. This was actually done, and the real interest of the members of the class was shown by their continued attendance in the new quarters in the same numbers in which they had previously come to the Massachusetts General Hospital.

In May, 1914, Miss Burrage died, and in June the members of the class came together to express their grief at their personal loss and their appreciation of the services Miss Burrage had rendered. At this meeting the suggestion was made that the class might perhaps be continued in the same form if the women would contribute something toward the salary of a new teacher. They gladly agreed to hold two meetings a week, and to contribute, each, twenty cents a week toward the teacher's salary. The plan then formulated has actually been in operation during the past winter. Miss Jennie Jansen, the pupil of Miss Burrage, who two years previously had carried the work into the orthopedic ward of the Massachusetts General Hospital, was chosen as teacher.

It is too early to say how the new enterprise will work out, but that something will come of it is certain. One interesting result already observed is that the class has undertaken to act upon principles of self-government, in accordance with rules determined upon by the women as a whole, or in separate committees. Funds are hard to get in these days, and all the members of the class are poor, while many of them live at a distance from the city, making the expense of carfares a necessary condition of their attendance. But their very desire to come has shown how confidently one may rely upon the best qualities in human nature, and how much good a single individual may accomplish who is able to see his fellow-beings at their present best, and to see, under their present best, the evidence of something better.

Original Articles.

GUN-SHOT WOUNDS OF THE SOFT PARTS.

By BETH VINCENT, M.D., BOSTON

AND

ROBERT B. GREENOUGH, M.D., BOSTON.

WOUNDS of the soft tissues in the cases at the American Ambulance, under the care of the Harvard University Unit at Neuilly-sur-Seine,

were produced, for the most part, by missiles such as shrapnel balls, rifle bullets or shell fragments. Among 318 such cases there was but one small bayonet wound. Two hundred and thirty-two of the cases had only one wound. Eighty-six of the patients had been struck by more than one missile, and in fifteen of the cases a single missile had caused multiple wounds. In one instance eight separate wounds were made in one individual by the passage of a single rifle bullet.

REGIONS.

An analysis of these cases in regard to the regions involved shows that there were 24 wounds of the head and scalp, 76 of the face and jaw, 64 of the trunk, 55 of the upper extremities, and 80 of the lower extremities.

Compound fractures of the jaw were of frequent occurrence; there were 63 fractures in 76 wounds of the face. The face wounds were often badly lacerated, with extensive loss of tissue. The treatment of the jaw fractures was carried out by the Dental Department of the Ambulance, by means of interdental splints, wedges, wiring, and bridging work, and very remarkable results were obtained by the ingenuity and skill of the members of this service. The face wounds were cared for on the general Surgical Service, and such operations as were needed for drainage, as for plastic closures of defects and deformities, were performed by the surgical staff.

Wounds of the trunk included 21 of the chest, 7 of the spine, 8 of the abdomen, 4 of the pelvis, and 24 others of a superficial character.

Of the extremities, the right and left side suffered in about equal proportions: right arm 28, left arm 27, right leg 38, left leg 42.

NATURE OF THE WOUNDS.

The wounds were of every kind,—lacerated, penetrating, perforating, or wide surface abrasions. They varied from the extensive, badly lacerated wounds of the jaw, made by irregular shell fragments, to the cleanly perforating bullet wounds of the thigh, or the small shallow penetrating wounds of the leg, often multiple, due to minute bits of exploded shells. When received at the American Ambulance the majority of the cases were from twenty-four to seventy-two hours old, and by that time the wounds were all very much alike in one respect—with few exceptions they were frankly septic. In some, the infection was caused by the gas bacillus, but as a rule the ordinary pus organisms were found. A more detailed description of the bacteriology of these cases appears in the report of Drs. Rogers and Benet, who were in charge of this part of the service.

The infection of these wounds was due mainly to foreign material, such as pieces of the soldiers' clothing which had been carried into the tissues by the missiles. This established a focus



FIG. 1.—Shell wound of buttock.



FIG. 3.—Multiple shell wounds of face and shoulder produced by hand grenade.



FIG. 2.—Bullet wound passing through soft parts of right arm, grazing abdomen, and producing compound fractures of both bones of left forearm.



FIG. 4.—Wound of face with destruction of upper lip.

of infection, from which more or less severe sepsis was likely to develop in spite of the application of a first aid dressing.

TREATMENT.

Occasionally a patient was admitted with a clean wound, or one so slightly infected that a

sterile dressing could be applied and the soldier sent to the wards. This was the exception.

The usual procedure was as follows: The patient was given a general anesthesia—ether, as a rule, sometimes gas and oxygen, and in a few instances chloroform,—the skin was shaved, painted with iodine, and the wounds enlarged as much as the extent of the infection required; the crushed edges of the wound of entrance and all necrotic tissue were excised; all the foreign material, such as dirt or particles of clothing, was removed. Some wounds were irrigated, others were simply wiped dry. Drainage was accomplished by means of cigarette wicks or



FIG. 5.—Result of first plastic operation for repair of Fig. 4.



FIG. 6.—Bullet wound of chin and jaw.

drains made of folded rubber tissue. Raw surfaces were covered with sheets of the rubber tissue to keep the gauze of the dressings from sticking to the wound. While no particular search was made for missiles at this time, they were often discovered and removed during the exploration. At times pieces of clothing were found just beyond, or even wrapped around, the missile. Wounds from which the foreign body and all particles of dirt and clothing had been removed usually cleaned up very rapidly in the wards. When pieces remained in the tissues, especially clothing, the course of the sepsis was always prolonged, and secondary abscesses often necessitated another operation. The after-care of these cases was quite as important as the operations. The dressings, which were very painful, had to be done frequently and with great care. The use of rubber tissue for wicks and as a protective covering, saved these patients much suffering. Some of the most septic wounds were given continuous irrigations of sodium-hypochlorite solution (1:200), others had frequently changed wet dressings, but most of the cases were dressed with plain sterile gauze. Even the very septic cases did surprisingly well, due, in part, to the good general condition of the French soldiers, and in a large measure to the skill and care with which they were treated by the house-staff. A well balanced unit needs, for such work as this, comparatively few surgeons to do the operations, but should have a large number of well trained men to look after the patients in the wards.

Secondary sutures were done on some cases with extensive granulating surfaces, with good results, and the patients were saved many days in their convalescence by this procedure.

Wounds that healed with a deformity or an unsightly scar were treated by plastic operations, and furnished some of the most interesting and instructive surgery of the service.

FOREIGN BODIES.

In many cases the kind of missile could be surmised only from the appearance of the wounds. Shell fragments gave ragged wounds, while bullets and shrapnel balls often left a clean cut tract, with small wounds of entrance and exit. Definite data were obtained in regard to 103 missiles which lodged in the tissues. The majority (77) were shell fragments, as might be expected from their irregular shape and comparatively low velocity. Fourteen were shrapnel balls, and thirteen rifle bullets. In one case the missiles were the fragments of a pair of field glasses, which had been driven into the face of an officer, who was looking through the glasses when they were struck by a rifle bullet.

While the first operation on recently admitted cases with gross sepsis was devoted primarily to cleaning the wound and making free drainage, missiles which had lodged were often located and removed in the course of this procedure. It was not, however, considered wise to make an extensive search for a foreign body at this time, and thereby possibly spread the infection to uncontaminated tissues. Since the limits of the infection was likely to be defined by the penetration of the missile and pieces of clothing, the pus in the wound often proved a valuable guide to the foreign body. In this way more than half the missiles were found at the first opera-

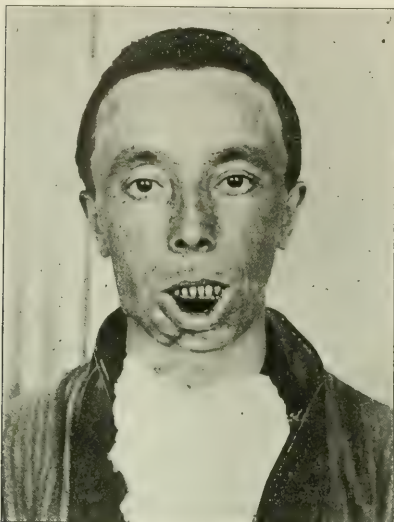


FIG. 7.—Result of first plastic for repair of soft parts, and dental bridge supplied by Dental Department.



FIG. 8.—Bullet wound of jaw, cheek and neck.

tion, frequently without the aid of the fluoroscope or x-ray plates.

Lodged missiles not removed at this time were allowed to remain in the tissues unless they caused a persistent sinus or made trouble by reason of their position near nerves or other important structures.

When the secondary removal of a foreign body was indicated the operation was postponed, if possible, until the wound had healed or at least had passed the stage of acute sepsis, and the foreign body was then located as accurately as possible.

LOCALIZATION OF FOREIGN BODIES.

At the American Ambulance the means of localization most frequently employed were the fluoroscope, x-ray plates, and the Bergonier electro-magnet. This magnet was devised by Professor Bergonier, of Bordeaux, and was operated with an alternating current in such a way as to produce rapidly alternating fields of attraction and repulsion, such that the shell fragment was put into rapid vibration in the tissues. When the magnet is brought close enough to a lodged missile, this vibration can be detected by placing a hand on the skin between the magnet and the foreign body. The place of maximum vibration is noted, and an incision made at this point. This method can be applied to missiles in the soft tissues only, and not too distant from the surface of the skin.

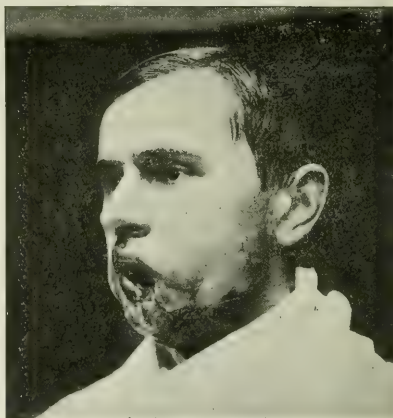


FIG. 9.—Condition before first plastic operation on FIG. 8.

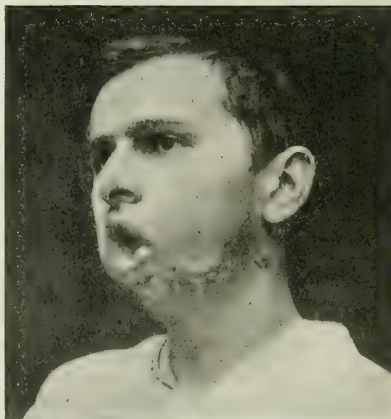


FIG. 10.—Condition after first plastic operation on FIG. 8.

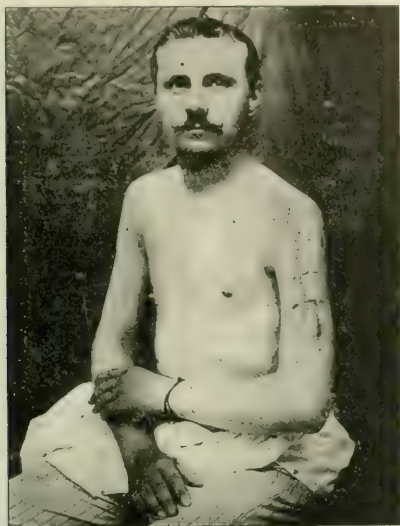


FIG. 11.—Secondary suture of shell wound of shoulder, similar to No. 1.

An ordinary electro-magnet was often used to facilitate the extraction of the missile after it had been located in the course of an operation. When a foreign body could be felt by the finger or some instrument, a metal probe, with its outer end resting against the magnet, was inserted into the wound until it touched the piece of metal. The probe became magnetized by contact with the magnet, and in turn at-



FIG. 12.—Shell fragments in soft parts around left hip.



FIG. 13.—Shrapnel ball lying in front of neck of femur. Joint involved secondarily with infectious arthritis.

tracted the missile so that it was made to adhere to the probe while this instrument was withdrawn from the wound. In some cases a sinus could be explored with the probe without an anesthetic, and pieces of metal extracted in this manner. While very useful under certain circumstances, this method has definite limitations. Missiles of lead alone, as the round shrapnel ball, are not attracted by the magnet. Moreover, it is first necessary to find the foreign body in



FIG. 14.—Shell fragment buried in muscles of back after traversing pleural cavity. Empyema; drainage, recovery, fragment not removed.

the tissues—so often the only difficult part of the operation—before the probe can be used, and unless the magnet is a powerful one, the hold on the missile is so slight that the least resistance will break the contact as the probe is withdrawn. In spite of these disadvantages, this method was applied successfully in certain cases at the American Ambulance. Foreign bodies in the brain or lungs can be recovered in this way with very little trauma to the tissues. In two cases Dr. Cushing removed shell fragments from the brain by this method, and Dr. Blake employed it successfully on a piece of shell buried deep in the pleural cavity.

For routine work the fluoroscope proved to be the most rapid, accurate and economical means of locating lodged missiles. The examination was made by an expert radiologist, Dr. Jougeas, who described the position of the missile and made marks on the skin to guide the surgeon at operation. With a bullet in the thigh, for example, the skin was marked at four points in two planes, at right angles to each other, so that the intersection of imaginary lines connecting the skin marks established definitely the position of the foreign body. In addition, the distance of the missile from the surface of the skin could be determined in centimeters by the method of triangulation. With these figures to guide the depth of the incision and the marks on the skin to give the direction, a missile was often found without difficulty, providing that the patient was placed on the operation table in exactly the same position in which the fluoroscopic examination was made.

X-ray plates taken in two planes were sometimes used alone, but difficult cases often required both the plates and the fluoroscopic examination, as it is a distinct advantage to have the plates or a print in the operating room, so that the surgeon can acquaint himself with the number and size of the foreign bodies and observe their relation to some bone landmark which he might expose during the operation.

Local anesthesia sufficed for simple cases, but what promised to be a short operation, at times developed into a long search, so that, as a rule, a general anesthesia was indicated in these cases. Gloves were worn at the beginning of all operations, but the end of a difficult one often found the surgeon working with bare hands, to increase his sense of touch. Occasionally, interesting points in anatomy would arise in these operations, since the wounds involved every part of the body, and a search for the missile might lead the operator into regions seldom explored in the ordinary surgery of civil life.

At the American Ambulance, where these various methods of localization could be applied, the operations for the recovery of lodged missiles were usually successful. An attempt to remove the foreign body was not made in every instance. There were 103 such cases—in 80 the missile was recovered, and in 23 it was not

removed. Four patients died before any search was made for the foreign body, while the 19 other cases represent, for the most part, those in which the missile was left "in situ" at the discretion of the surgeon. This decision was made in cases where the fragments were small and numerous or because of an absence of symptoms which could be attributed to the presence of a foreign body. In a few instances the position of the missile made its removal so difficult that the benefit to be obtained did not justify the risks of the operation.

SOME OBSERVATIONS ON 600 HEART CASES.*

By MARK H. WENTWORTH, M.D., CONCORD, MASS.

IN March, 1912, I began to assemble all of the heart cases at the Boston Dispensary, taking the new cases as they came in, those referred, and sending letters to all of the old cases which could be found on the records, asking them to come for examination. Between March, 1912, and May, 1914, there were thus assembled 600 cases of children between the ages of 6 weeks and 15 years with one or another form of heart weakness, rheumatism or chorea. These last two were included because of their supposed common etiology and the frequency with which cases of rheumatism and chorea develop cardiac lesions. Of the whole series there were but 30 which had rheumatism *not* followed by a heart disturbance of some sort,—and most of these were admissions of comparatively recent date; some of them had moved and some did not reply to the letters, so that it is quite possible a number of those few remaining cases have since developed some heart lesion.

The list shows:

Acute endocarditis.....	249	cases or	41.5 %
Chronic endocarditis.....	33	" "	5.5 %
Mitral sten. and regurg.....	29	" "	4.8 %
Aortic and mitral regurg.....	12	" "	2.0 %
Aortic stenosis.....	1	" "	.16%
Aortic regurgitation.....	2	" "	.33%
Tricuspid regurgitation.....	1	" "	.16%
Endocarditis and myocarditis..	26	" "	4.3 %
Functional.....	26	" "	4.3 %
Intermittency with other signs..	1	" "	.16%
Chorea with heart involvement..	115	" "	19.1 %
Chorea without heart lesion....	61	" "	10.1 %
Rheumatism without heart involvement	30	" "	5.0 %

Etologically the acute and chronic endocarditis cases showed:

155 with previous rheumatism or tonsillitis.
37 with previous acute infections.
88 untraceable.
1 nephritis.
1 malaria.

* Read at a meeting of the Chirurgical Society of Boston, held on Oct. 22, 1915.

Etiology mitral lesions:	
Rheumatism	21
Acute infection	8
Unknown	12
Etiology of aortic lesions:	
Rheumatism	6
Acute infection	3
Unknown	6
Etiology tricuspid:	
Unknown	1
Etiology myocarditis:	
Rheumatism	14
Maternal specific	1
Specific	2
Acute infection	2
Unknown	2
Etiology congenital:	
Maternal specific	1
Specific	1
Etiology intermittent without other sign:	
Unknown	1
Etiology chorea with heart:	
Rheumatism	39
Acute infection	13
Unknown	60
Trauma	3
Etiology chorea without heart:	
Rheumatism	18
Acute infection	9
Unknown	33
Trauma	1

Thus, of all the cases in this series 270 were apparently caused by rheumatism or tonsillitis, 82 by acute infectious diseases. Etiology undetermined in 239 cases. From these figures it is evident that rheumatism is the factor to be most greatly feared, and consequently the most strenuously attacked.

Children are far more liable to attacks of rheumatism than others, recurring attacks are more frequent in them, and cardiac involvement following rheumatic infection is more frequent. The greatest danger is in the recurrence of an attack, but we know so little of the methods of infection and the processes of its invasion into the system that we can act only empirically. If it seems that a locality predisposes to rheumatism, I think we are justified in advising the removal of the patient to another climate when the circumstances permit; the choice must again be empirical, but most cases are found to do better on the whole in a high, dry, warm, and more or less equable climate; hot sulphur and hot saline baths, baking in superheated air; internally, iron, arsenic, cod liver oil, potassium iodide, the salicylates, best used in the form of aspirin in bicarbonate of soda; tonic—digitalis. (The only forms of cardiac stimulant I have used are *Tr. strophanthus* and *Tr. digitalis*.)

As the tonsils seem to be a common mode of entrance for the infecting organism, are we justified in always recommending their excision? I have no figures to give on this point, unfortunately, but I have recommended a large number of children in the past to have the tonsils removed, and having seen a fairly good percentage of these cases return with reinfections, I

have doubted the wisdom of the procedure, and seldom advocate it now except in cases which have had marked recurring attacks, or where it is evident from the past history that the child is subject to tonsillitis. Of the results from this conservative method, I do not yet feel justified to speak, although I am well aware that many advocate enucleation upon very slight pretext.

During the acute symptoms, or while there is failure of compensation, we must limit the physical activity to a pretty marked degree. I feel sure that three of the cases in my series died because of lack of sufficient rest. I watched them carefully in the clinic and in their homes, and noted the recurrence of edema, dyspnea, orthopnea, and precordial distress which accompanied their exceeding the bounds of rest which had been laid down for them, and which, (in spite of their distress occasioned by the exertion), they could not be made to desist. This, I feel assured, was the case in other fatalities in the series which I did not personally attend.

In the *American Journal of Diseases of Children*, August, 1913, vol. vi, pp. 104-106, Dunn says: "It is questionable how far our efforts should reach in limiting the normal activities of the child. We must consider the question of lessening the disability in adult life, when the heart must be able successfully to cope with the strain of a normally active life. If such ability is due to a gradual adaptation between the child and the heart, it is very probable that too much limitation of the activities of childhood will prevent this adaptation from taking place." I quite agree, after the acuteness or even sub-acuteness of the symptoms are gone, but I believe from observations on the above cases that anything more than moderate activity for a considerable period after an acute infection does irreparable harm.

The diseases which may have a causal relation to cardiac disturbances are measles, chorea, tuberculosis, influenza, small pox, diphtheria, pertussis, and scarlet fever; but colds and coughs and adenoids must be considered, and more especially, pharyngitis and tonsillitis.

Endocarditis is by far the most frequent lesion found in chorea, and from my series of 176 cases, the fact that 115 showed cardiac disturbance, 65.3%, is significant of the fact that chorea as such, or the etiological factors in chorea, have a detrimental effect upon the heart; or is it possible that endocarditis is the cause of the chorea, particles of fibrin and vegetations from the valves passing as emboli to the cerebral vessels and there setting up the irritation resulting in chorea? In none of these cases were there any signs of heart disease observed prior to the development of chorea. This in itself is not sufficient evidence to exclude the pre-existence of a heart lesion, but the 61 cases, 35.6%, of chorea occurring without any evidence of heart infection tend to overthrow this theory.

Osler gives somewhat similar evidence in his monograph on chorea. Of 140 cases observed

more than two years after an attack he found the heart normal in 51, in 12 there were functional murmurs, and in 72 organic disease. His examination comes at a later period, but shows about the same percentage of permanent cardiac injury. Kirkes and others also state that endocarditis is the most frequent lesion in chorea, but their exact relationship is as yet undetermined.

When we consider that choreic patients are usually of the high-strung, nervous, often anemic type, it is natural to expect to find rapid pulses, and this is what we find much more commonly than arrhythmia; this is accompanied by a diffuse impulse at the apex and throbbing carotids, with a systolic murmur at the base and often at the apex, but the endocarditis of chorea is usually of the simple or warty form and is, Hirschfelder tells us, of itself not dangerous, but there is always the danger of its leading to sclerotic changes in the valves which produce incompetency.

Two hundred and fifty-seven observations were made on the blood pressure, an effort being made to see how it was influenced by rest, and by rest and Tr. digitalis medication.

In the cases where *no drug* was used, the patients simply having stated periods of rest and a supervision of their hygiene, the effect produced upon the *systolic pressure* showed nothing striking; there was a tendency to a raising of the pressure slightly, but it was not marked. The *diastolic pressures* showed a slight reduction, this being invariable where the first readings had been very high, and in these cases the reduction was correspondingly great, and the readings as a whole approached comparatively near normal (i.e. 45-60). The *pulse pressure* (normal 30 to 50?) was moderately to decidedly increased, i.e. from 2 to 40 m.m., over periods ranging from one week to one year.

Under the influence of *digitalis*, which was combined with rest, the *results on the systolic pressure* showed a much greater and more uniform tendency to rise. I say tendency, because there were a good many cases, showing a not unusually high systolic pressure, which fell somewhat during treatment.

The diastolic pressure when treated with digitalis showed much the same readings as when the patients were given rest only. There was certainly not enough difference to indicate any physiological effect from the drug.

Digitalis should not be used with a free hand or indiscriminately. Its action should be watched carefully. The heart rhythm is distinctly slowed by the use of digitalis, and the force of the apex beat is much strengthened and slowed, thus slowing the pulse and increasing its tension. Where no appreciable effect is noted on the pulse one should examine the heart and general circulation before increasing the dose, as it may already have had the effect of increasing the output of urine, relieving the dyspnea and

decreasing the edema, which may be all you can afford to attempt at one time in a given case.

In cases showing degeneration of the heart muscle, such as fatty heart, digitalis may be absolutely contraindicated, for the increased pressure thus brought to bear may cause serious damage.

In cases of tachycardia I found that minute doses of aconite or strychnine are used to better advantage than digitalis in reducing the accelerated pulse.

ARE THERE DIFFERENT ANATOMIC TYPES? A REPLY TO DR. HOOTON.

BY JOEL E. GOLDTHWAIT, M.D., BOSTON.

In the issue of the JOURNAL for Jan. 27, the article by Dr. Hooton, on "Some Anthropological Comments upon the So-Called Herbivorous and Carnivorous Types of Man," shows that the Doctor has missed entirely the purpose of the Shattuck Lecture.

The real reason for that Lecture was to emphasize to the profession the need of the study of the *individual* in the interpretation of symptoms which the medical profession is expected to relieve. No one probably appreciates more than I the desirability of careful anthropological study, but probably no one can appreciate better than I the fact that the study of the average, or the composite, of any group will not explain the variations from that composite which may be present in the individuals of the group. The work of the anthropologist, as is true of the teaching of the works of anatomy, has been based upon the study of groups of individuals and the deductions represent studies of the average formed from these groups. This makes it possible for Dr. Tait McKenzie to model his beautiful figure of the athlete, but it does not help the many individuals who are formed so very unlike the ideal figure, and whose peculiarities are lost in the composite study of the whole.

The practical result of this is that the medical student has been taught, and is still being taught, that the human body is of one type. That this type exists there can be no question, but that there are departures from this type there can also be no question, if the study of the individual is approached with the "large field of vision" which the Doctor apparently desires.

To appreciate these differences or departures from type, one must study the individuals of the special race and not try to contrast the people of different races and expect to get much practical help from that. For instance, there is the broad and the slender type of Anglo-Saxon; there is also the broad and the slender type of Scandinavian. This is also true of the Asiatic, of the Australian, or of any of the other tribes or races. It is by comparing the individuals of

one race that real progress will be made, and not the comparing of the average type of one race group with the average type of another race group.

The terms "carnivorous" and "herbivorous" which were used are undoubtedly not scientific and will undoubtedly be replaced by other terms when sufficient investigation has been carried on to make such selection possible. These terms are, however, suggestive and the more one studies comparative anatomy the more suggestive they become. The fact, however, that they were not considered satisfactory for final terms by me is shown by the fact that in the description of each group not only are these terms used, but all of the other terms which had been used by the different writers. Any suggestions which Dr. Hooton has to make that will make it possible to choose more satisfactory terms will, of course, be welcomed.

My use of the term "African" in the Shattuck Lecture is, of course, one which leads to fair criticism. My intent in using the word was to have it apply to the Negro, or the African, as we are familiar with him in this country. In the Negro, as we see him, we have, of course, the slender as well as the heavy type, but the slender is much less common, undoubtedly largely because of the poor hygienic condition under which the negroes have lived, this slender type being much less resistant to disease than the heavy type.

As to the shape of the vertebra, all that I will ask is that the investigator will make the study by means of the x-ray or by actual dissection of the lumbar vertebra in the different types and see if the characteristics described in the Shattuck Lecture do not exist. The Doctor speaks of certain characteristics which were shown in one of the illustrations of the lumbar vertebra as being peculiar to the dorsal vertebra. These characteristics which are peculiar to the dorsal vertebra, as they show in the lumbar vertebra, have all been described by me in a previous article. The crescentic articular process, which is considered normally a part of the lumbar vertebra, frequently does not exist, but instead the articular process is flat, as is a normal feature with the dorsal vertebra. The presence of these flat articular processes in the lumbar region is particularly frequent on the last two lumbar vertebrae. This can, of course, be demonstrated by x-ray as well as by dissection.

In appreciating the variations in the shape of the vertebrae it will undoubtedly be interesting to Dr. Hooton, as it will to anyone who is interested in the general subject, to study the remarkable collection of spines at the Warren Museum of the Harvard Medical School, which was prepared with great care by the late Prof. Dwight.

The main purpose of the Shattuck Lecture was to call the attention of the profession to the fact that there are different types and to make

the profession realize that the variations from the so-called normal type are the ones most likely to be seen as patients, because they are most liable to disease conditions. It was the hope that, by stimulating the profession to this kind of investigation of their patients, a new channel would be opened for investigation so that the knowledge of medicine would be advanced. In other words, it was to do just what Dr. Hooton suggests in his sentence,—"The point that I wish to make is that Dr. Bryant has left out of his calculations the changes in bodily form due to age, and who knows to what extent the length of the gut may vary in its absolute and relative size during the life of the individual?"

It was exactly this kind of investigation that I hoped to stimulate, and that I am sure Dr. Bryant would welcome. Dr. Hooton here admits that the anthropologist does not know about these features. The medical profession knows little more, but it is probable that, if such investigation as has been suggested can be carried on, the knowledge which we all desire may be obtained and the anthropologist perhaps gain knowledge from such investigation as well as the physician.

Clinical Department.

ABSCESS OF THE TONGUE WITH REPORT OF A CASE.

By JOSEPH PRENN, M.D., BOSTON.

THE text-books on nose and throat say very little on this subject; some omit it altogether. The infrequency of this condition (not many cases are on record), the difficulty of diagnosis in its early stages, the striking picture and pronounced symptoms in its later stages, made the writer think it a case worth reporting. The etherizer and the surgeon, especially the former, have a task before them similar to retro-pharyngeal abscess with edema of the glottis.

Acute abscess of the tongue does not happen often. The great vascularity of this organ offers it a superior resistance, and the abundant various organisms harboring in this region probably establish a local immunity. The two main factors upon which disease depends generally, namely, the resistance of the tissue and the virulence of infection, hold true here also. Trauma, therefore, such as biting of the tongue, irritation and wounding of the mucous membrane by bad teeth, stempipe, ranulae, and calculi in the various salivary glands, or foreign bodies in the tongue when the resistance of the tissue is lowered, may serve as a factor to bring about supuration.

Follicular abscess of the lingual tonsil may by extension through the follicles of the tongue transmit the infection and form an abscess. The

lessened resistance of the body generally, however, such as run-down condition, or exposure when the entire body is thrown out of gear, seem to be necessary accompanying factors.

Diagnosis.—Early diagnosis is difficult, as the patient may complain of a slight sore throat, there may be only a beginning glossitis and pain in the head, temperature may be normal. The steadiness of the pain, as time goes on, and its distribution, however, are characteristic, and therefore make one suspect a possible forming abscess. The pain is felt acutely and steadily in the tongue, neck, ear and temporal region, growing progressively worse. The pain is so severe that it makes one think of the *douloureux*, but the steadiness of the pain points to some constant pressure and therefore differentiates it from trigeminal neuralgia. The regions affected are due to the fact that the lingual nerve supplying the anterior two-thirds of the tongue with sensation connects with the auriculo temporal of the third division of the fifth. The glosso-pharyngeal nerve supplying the posterior third of the tongue with sensation sends off the tympanic branch (Jacobson's nerve). In the later stages the symptoms are more pronounced and more numerous, and present a distinct picture. There is a temperature of about 101. The patient has good color, in spite of the exhaustion, due to the congestion,—the same as a person wearing a tight collar would have. The tongue is swollen two or three times the normal size, and is coated.

There is great difficulty of deglutition, the patient cannot open his mouth more than a slit, and speech is inarticulate. Movement of the tongue is painful. The side of the tongue where the abscess is, is sore to the touch, and the pain in the head is very severe. Fluctuation is very hard to make out on account of the elasticity of the tongue, and it may be absent altogether, as the pus burrows down. The sub-maxillary glands are swollen and tender, and if the posterior third of the tongue is affected there will be swelling of the cervical glands. On palpation the under surface of the tongue is hard, and there is one spot where it is thicker and more tender to the touch,—the seat of infection.

Prognosis. If left alone, unfavorable. There is a marked exhaustion, it may be even dangerous to life from spasm of the glottis pressing upon the superior laryngeal nerve. Septic pneumonia and pericarditis may develop when there is a streptococcus infection. The abscess sometimes in the later stages, though rarely as the pus burrows deep in the tissues, may break spontaneously in the mouth, where again there is danger of the pus going down the larynx, if the patient is asleep, and causing asphyxia.

Treatment. Operation. It may perhaps be done under local anesthesia by injection of novocain, but the patient who is suffering such intense pain, with inability to open his mouth, will hardly submit himself to such procedure. General anesthesia, therefore, must be administered. Perhaps anesthetizing the patient in a sitting

position will obviate much of the danger of asphyxiation and not necessitate a tracheotomy. Butlin reports a case of asphyxia during anesthesia by breaking of the abscess during manipulation into the larynx. The sitting position, the writer believes, would obviate this danger. The anesthetizer will have little difficulty in administering the narcosis, as the patient welcomes it, much the same as a pregnant woman in the latter stages of labor. The incision should be made about half an inch in length, under and parallel to the side of the tongue, having previously introduced the finger to ascertain the most tender point. That point will be found to be more thickened than the rest, and pus ought to be gotten there. To lift up the tongue and make the incision under its tip is more dangerous on account of the ranine veins and artery and lingual nerve. By lifting this organ you also draw upon the sub-lingual gland, in which the sub-lingual branch is superficially imbedded, and this can easily be injured. The incision on the side is not altogether void of danger of wounding the lingual artery and nerve, especially when it is essential for the assistant to lift and turn the tongue to the opposite side, thus forcing the structures more to the surface. But the incision made parallel to these structures and in the most thickened part of the edematous tissue, the danger is greatly minimized.

The following case will illustrate the subject, and is of interest:

Male, married, twenty-nine. Had mastoid operation with cure, six years ago; dysentery, four years ago. In good health since. Had business worries of late, and was in a run-down condition. On October 4th, he woke, having slept with the windows open, complaining of slight sore throat, slight pain in the tongue around the angle of left jaw, neck, ear, and temporal region. On the following day went to see a doctor, who thought it was neuralgia. Went to a wedding on the same night and came back feeling worse. Thought the food did not agree with him and took a large dose of castor oil. The pain in the above regions, especially the ear and left temporal ones, persisted and grew worse.

On October 7th, the symptoms became very pronounced, there was quite a marked glossitis and he was unable to open his mouth. Could not sleep and was given a hypodermic of morphine. On the following day he was given two more hypodermics. On the evening of October 8th, I saw him in consultation with Dr. Charles H. Masten, of Worcester, Mass. The patient showed nervous irritability, characteristic of exhaustion. Looked well in spite of not having eaten or slept for days. He must have been in agonizing pain in spite of the previous doses of morphine, for when questioned as to what was the matter, he pointed to his head. He tried to talk, but speech was inarticulate. He could hardly open his mouth. The submaxillary gland was swollen and tender, there was also edema of the left side of the neck. The tongue was very thick, about three times the normal size, hard, and coated. The tongue depressor produced pitting. Teeth in good condition. The soft palate and the beginning of the anterior pillars could be examined with difficulty

and showed no edema except for the uvula. The structures of the under surface of the tongue were markedly swollen. On palpation with the little finger, it proved tender to the touch with the maximum intensity at a point opposite the second molar tooth. That point was rather harder and thicker than the rest. Temperature, 101.2. Pulse 90. Ether was administered, the patient became cyanotic, artificial respiration with traction upon the tongue had to be resorted to. The operation was performed in a sitting position by reflected light. The tongue was lifted and rolled over to the side, and an incision was made with a straight knife about one-half inch in length, in the most thickened spot, under and parallel to the side of the tongue. The opening was dilated with forceps and about two teaspoonfuls of foul pus were evacuated. A probe was put into the opening about two inches deep and did not show any pockets. A strip of gauze was put in the wound and left there. Cracked ice on tongue ordered.

Dr. Masten informed me that the patient made an uneventful recovery after the pus was evacuated, and the wound closed on the second day after the packing was removed. The infective agent, as suggested by Dr. Masten, must have been the staphylococcus on account of the absence of high fever and the large amount of pus found.

On my second visit, when the throat could be examined satisfactorily, the following interesting point was noticed: The uvula was still swollen and a red streak was running from it along the anterior pillar down to the tongue. The tonsils were not inflamed and the pillars not congested. Whether the primary infection started in the uvula, and from the glands around the uvula was transmitted by the way of the lymphatics along the anterior pillars to the sides of the tongue, or vice versa, the writer is not prepared to say, though it is more reasonable to assume the latter.

I wish to thank Dr. Charles H. Masten, of Worcester, for the information given and for the valuable assistance rendered at the operation.

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AN OPERATION FOR THE CORRECTION OF THE DEFORMITY DUE TO "OBSTETRICAL PARALYSIS."

By MARK H. ROGERS, M.D., BOSTON.

THIS case is reported to show the result of an operation which seems to have a very definite place in the correction of the deformity that results from the so-called "birth palsy." Lately there has been considerable discussion as to the exact lesion in these cases, whether the results are due to a tearing of the brachial plexus or whether these may be a congenital dislocation of the shoulder joint. Whatever is the underlying



Before operation.

cause and what treatment in the early stages should be employed are not considered in this report. The deformity that results is practically always the same, with the amount of paralysis of individual muscles varying in each case.

The usual deformity that follows brachial paralysis occurring at child-birth is essentially an inward rotation of the whole arm from the shoulder-joint, so that, when the hand lies normally against the side of the body, the elbow is carried away from the body. This is well shown in the first illustration, which was taken before the operation. The elbow-joint is rotated so that the anterior surface points toward the body instead of directly forward.

Without taking into consideration the extent of the paralysis, and we know that it varies to a great extent, the resulting deformity is practically always as described. As the child grows older the deformity becomes more conspicuous, and it is the carrying angle of the elbow that is most prominent. Another result of the deformity is seen when the patient attempts to raise the hand to the mouth. With the direction of the elbow-joint reversed, it is always necessary to raise the arm away from the body to bring the hand up. Also when the patient attempts to use the hand as in picking up any object or in the ordinary handshake, it is necessary first to rotate the whole arm and also to bring the elbow away from the body.

The operation here shown for the correction of the rotation has been in vogue in Germany,



Before operation.

and has been described by Vulpius and Lange. The result, as shown by the photographs of the case, is given because the operation is evidently not employed here very often, and it does seem to accomplish a very definite object.

The operation is simply an osteotomy of the upper portion of the humerus about two inches below the shoulder joint, followed by a one-quarter rotation of the whole arm below the line of fracture. An incision is made between the muscle planes sufficiently long to be sure that there is no nerve involvement. A clean cut osteotomy is done, and before the incision is closed the arm is brought out at a right angle to the body and the lower fragment is rotated outward, while traction is kept on the hand. The tip of the finger is held on the fracture to see that there is no overriding and that the position is good. The wound is closed and the arm and body are encased in a shoulder spica with the arm full-length at right angles and the palm of the hand pointing upwards. It is then treated as an ordinary fracture.

The results of the operation are a normal carrying position of the arm, with the elbow at the side, and a normal position of the hand. It is also a striking feature that it is possible to bring the hand to the mouth so that it is possible to use the hand normally while eating.

The only possible danger seems to be the possibility of non-union from poor position of the fragments. This is very slight and may be obviated by the use of a bone-plate if necessary. Three cases form the basis of this report, the



After operation.

photographs of one being shown here, and they have all given good and equal results. It is not an operation to be done in the early steps of the paralysis, but only after the deformity has been developed. It evidently allows a more normal use of the hand and arm, and also corrects a very prominent deformity, which is very noticeable and objectionable.

Medical Progress.

PROGRESS IN PEDIATRICS.

LOBAR PNEUMONIA IN INFANCY AND CHILDHOOD. A SUMMARY OF THE LITERATURE OF THE PAST TEN YEARS.

BY JOHN LOVETT MORSE, A.M., M.D., BOSTON.

(Continued from page 135.)

TREATMENT.

Fresh and Cold Air. Northrup, in a paper read before the Pediatric Section of the New York Academy of Medicine, January 14, 1904, entitled "The Treatment of Bronchopneumonia in Children," called attention to the importance of the hygienic treatment of diseases of the respiratory tract in childhood. He advocated fresh air, a large room with southern exposure and the bed in the middle of the room.

The air should be fresh, cool and flowing. The temperature should be below 65°F. He stated at that time that flowing and fresh mean the same. He emphasized the fact that no one "catches cold" from cold air on the face. It was in this paper that he gave his classical description of how to kill a baby with pneumonia. It is well worth quoting, and is as follows: "Crib in corner of room with canopy over it. Steam kettle; gas stove (leaky tubing). Room at 80°F. Many gas jets burning. Friends in the room, also the pug dog. Chest tightly enveloped in waistcoat poultice. If child's temperature is 105°F., make a poultice thick, hot and tight. Blanket the windows, shut the doors. If these do not do it, give coal-tar antipyretics and wait."

He published a series of papers during the next three years on this same subject, but applying more especially to lobar pneumonia than to bronchopneumonia. From advocating open windows and the bed in the middle of the room, he successively recommended taking out the windows, putting the head of the bed in a bay window with the windows open, and finally putting the patient out of doors. His last paper was published in 1906. In this he stated that he had been treating pneumonia patients in cool, fresh air for more than eleven years, that he had gradually placed their beds nearer and nearer the window, and during the last winter had put them out on the roof. He summarized his results at the Presbyterian Hospital during the preceding winter as follows: The cases most favorably affected by the open-air treatment are those with severe poisoning, with delirium, partial cyanosis or deep stupor. No cases of pneumonia were injured and a few were much aided, possibly saved, by the cold, fresh air treatment. The only regulation is to make the patients comfortable, keeping their feet warm especially. The ears, nose and hands may get cold without harm.

This method of treatment, although it naturally at first met with opposition and some ridicule, was soon adopted, more or less completely, by most pediatricians and by many practitioners. Northrup and Freeman and those working with them have continued to use it, and still advocate it enthusiastically.

No very satisfactory explanation for the supposedly beneficial results of this method of treatment was advanced, however, at first. Patek summed up the prevalent opinion somewhat as follows: "Cold, applied externally, is a respiratory stimulant. Every intensification of the breathing effort means the absorption of an increased amount of oxygen-laden air. Respiration becomes deeper, less frequent and less labored. This stimulation of the respiration brings relief to the over-burdened heart and meets a very important indication in pneumonia." It is noticeable that the emphasis is laid on the coldness of the air rather than on its

freshness, which Northrup originally thought most important.

Howland and Hoobler, writing in 1912, state that it is apparent that children, seriously ill with pneumonia, may have a blood pressure somewhat below what might be expected at their age and that the symptoms of the death of children from pneumonia are those of vasomotor failure. They found that the effect of cold, fresh air in patients with active pneumonia was always to produce a rise in blood pressure. Removal to a warm (65°F.±) room produced a fall in blood pressure. The results were absent or much less striking in convalescents. They were unable to get any results by putting children out of doors in warm weather. They concluded, therefore, that the all-important factor in the out-of-door treatment was cold, and that the rise in blood pressure was brought about by reflex stimulation of the vasomotor centre by the action of the cold air on the skin. They also state that there is no doubt that an increase in the blood pressure, when it is abnormally low, which is constant and continuous, and which is brought about without exhaustion or bad effects, is of the greatest value. This explanation of the beneficial effects of the out-door treatment was generally accepted.

About this time, however, Weigert published a paper in which he concluded, on the basis of his own experience and from his study of the literature, that no rule can be established for the blood pressure in pneumonia, and that in consequence blood pressure readings are of no prognostic value. Newburgh and Minot, in 1914, from a study of a considerable number of cases, mostly in adults, found that the systolic pressure in the fatal cases was continuously above the systolic pressure in the persons who recovered. They concluded, therefore, that failure of the peripheral circulation cannot be a common cause of death in pneumonia. Porter and Newburgh have also recently shown experimentally that the vasomotor centre is not impaired in fatal pneumonia in animals. It is evident, therefore, that whatever systemic and beneficial action cold air may have in pneumonia, it is not through its action on the vasomotor system.

There is no doubt that children with pneumonia are more comfortable when the air is fresh and cold than when it is dead and warm. It is very doubtful, however, whether the mortality of lobar pneumonia in childhood has been lowered materially, if at all, by the cold air treatment. The statistics at present available are certainly entirely insufficient to show what influence it may have upon the mortality. Northrup himself has called attention to the difficulties in the way of drawing conclusions as to the effect of this treatment on the mortality, in view of the fact that 90% or more of children with pneumonia recover under any and all forms of treatment and that "even the worst treatment seldom kills them." Lowenburg ex-

presses the opinion of many when he says that his "experience with cold, fresh air has been satisfactory, but he cannot truthfully say that recovery in each instance would not have taken place had it not been used."

Chapin, in a recent paper, states that in his experience feeble infants ill with pneumonia do not do well when the windows are wide open day and night in winter. His aim is to have a steady supply of fresh outside air delivered into a ward that has been moderately warmed. He finds that this is the most satisfactory treatment.

Leucocytic Extracts. Hiss and Zinsser brought out their treatments of infections with leucocytic extracts in 1908. They argued that digestive, poison-neutralizing and complementary substances might be liberated from leucocytes by methods of extraction which, when injected into infected individuals, might act not only by protecting the flagging leucocytes and permitting them to recuperate, but also serve as a shield for the more specialized cells. They first experimented with animals infected with various organisms, such as pneumococci, and obtained favorable results. They were unable to determine the exact action of the extracted substance, but concluded that it was probably one active in neutralizing poisons—an anti-endotoxin or an endo-antitoxin. Fresh, living leucocytes had no action. Among others they treated seven adults, ill with lobar pneumonia. They used aqueous extractions of rabbit leucocytes, administered subcutaneously. The leucocytes were obtained by pleural inoculations of aleuronat. The fluid was quickly centrifugized and the serum decanted. The leucocytes were then washed in normal sodium chloride solution, emulsified in distilled water, allowed to stand for a few hours at 37.5° F., and then at icebox temperature until used. The clear supernatant fluid was ordinarily alone used. The usual dose was 10 c.c., repeated once or twice daily. There was a drop in the temperature after each injection, and an apparent improvement in the general condition. The duration was apparently shortened in one case. They note that the number of their cases was too few to form the basis for a true opinion as to the value of the treatment, also that pneumonia naturally terminates by crisis and is of irregular duration. Their impression was, however, that further clinical tests might not unlikely prove it to be of definite therapeutic value.

Floyd and Lucas, in 1909, treated 41 cases of pneumonia with leucocytic extracts prepared in this way. Twelve of these patients were between two and one-half and fourteen years of age. Pneumococci were found in the sputum of all of them. They state that constitutionally the patients felt better soon after an injection and that the symptoms of toxemia were relieved. Five of the patients died, giving a mortality of 12.2%. Two of these were children with bronchopneumonia. Complications appeared in only two cases. The mortality at the time in untreated cases was about 25%. The course of the

disease was apparently shortened in a number of instances. The signs in the lungs increased in some patients; in others resolution was apparently hastened.

Reynolds, in 1914, used this method of treatment in nine cases with no deaths. Four of his cases were in children between two and seven years of age. He believes that this method of treatment modifies the temperature curve, diminishes the toxic symptoms and albuminuria, but does not shorten the course of the disease or prevent extension of the process in the lungs. He believes that it lowers the mortality remarkably. The good effects of the treatment are, however, not evident from his description of the cases.

Vaccines. The treatment of pneumonia with vaccines has come up during this period. Many papers have been written about it, but very few of them deal with children. A considerable proportion of them have been published in trade journals, and most of them show evident bias or are based on incomplete and unreliable observations. The paucity of reliable data on the effect of the vaccine treatment is most striking, when the immense amount of advertising which it has received and the probable extent to which it has been used are taken into consideration.

One of the earliest papers on this subject was by Leary, who reported a series of cases in adults treated with a stock vaccine. His results were most encouraging. He claimed that there was either none or a very fleeting negative phase in pneumonia and that there was, therefore, no danger of doing any harm by the treatment. He stated that a combined investigation was to be undertaken, and the literature of the next two or three years contains many references to it. We have never seen any report of the results of this investigation, however, although Leary's paper was published in 1909.

Charteris treated 19 cases with a polyvalent stock vaccine. Six of these patients were children. His results in these cases were as follows: (1) 9 years old. Crisis on fourth day, soon after injection. (2) 14 years old. Crisis on fifth day, 48 hours after injection. (3) 5½ years old. Three injections on fifth, seventh and eighth days. Crisis on ninth day. (4) Boy, injection on third day. Falling temperature for 36 hours. Hectic temperature, and empyema on seventh day. (5) Boy. Injection on third day. Crisis in 12 hours. (6) 10 years old. Injection on sixth day. Pseudocrisis in 12 hours. Crisis on eighth day. He concluded from the study of all his cases that the treatment had no marked effect on the subsequent course of the disease. The mortality was slightly higher than in the controls—21%:20%. The early administration of the vaccine did not abort the disease, nor prevent complications. Complications were relatively frequent in the vaccine series.

Raw used a stock pneumococcus vaccine in 207 cases. Thirty-four died, giving a mortality of 16%. Thirty of his patients were between

one and ten years of age. Two died, giving a mortality of 6.6%. He concluded that the vaccine always reduces the pulse rate, but that it does not hasten the crisis. He states that it is very difficult to estimate the value of the treatment, because of the number of other factors which have to be taken into consideration. He believes that vaccines are a valuable aid, but not a specific remedy.

A statement in the *Journal of the American Medical Association*, in 1913, in answer to a query, sums up the situation very well: "The vaccine treatment of pneumococcic infections is still on trial. So far there is little evidence of its efficiency. There is little evidence that stock or autogenous vaccines are of value in pneumococcic infections. R. W. Allen (Bacterial Diseases of Respiration) gives statistics from various sources, most of which are favorable, but the numbers of cases are so small that no reliable conclusion can be drawn from them. Schorer (Vaccine and Serum Therapy) says active immunization will probably never be of great value in the majority of cases of lobar pneumonia due to pneumococci, because the crisis comes on about the time the results can be expected from the vaccination."

Rosenow has written a series of papers on the treatment of pneumococcal infections with partly autolyzed pneumococci. In connection with Hektoen he treated a series of cases of pneumonia in adults in this way. They reported favorable results. This method, so far as we know, has not been used in children.

Serum Treatment. Römer's serum, which is a polyvalent serum, was being used in Germany to a considerable extent at the beginning of this period. Most of the work, however, was done on adults. Lindenstein treated four cases in all. One of these was in a child of 5 years. The serum was given on the second day; the crisis occurred on the seventh day and the child recovered. He thinks that the subjective symptoms were markedly improved, and recommends the use of the serum highly.

Krische treated five children, varying in age between nine months and ten years. All recovered. He claims that there was improvement in the subjective symptoms, a fall in the temperature and pulse, and hastened resolution after the injections. Analysis of his cases shows, however, that in one instance four lobes were involved in succession in spite of frequent doses of the serum. There was, moreover, no evident shortening of the course of the disease in the others, with one possible exception. In this, however, the duration of the disease before the beginning of treatment is not given.

Monti used the serum in twelve children whose ages varied between thirteen months and nine years. There was a fall of temperature, and resolution began in all cases from two to four days after the beginning of the treatment. Repeated injections were given. He states that there was improvement in the general condition

and dyspnea in all. No complications occurred, and all recovered. Brüning criticises Monti's paper, however, because he does not distinguish between the day of the disease and the day of the beginning of observation. He states that it is not plain that the crises were not due to the natural course of the disease rather than to the injections.

Crux treated twelve cases, aged between nine months and twelve years. All recovered without complications. He concluded that Römer's serum had an extraordinarily favorable, almost sovereign, action; that it was not dangerous, if the heart was sound; that there was a striking improvement in the general condition after the injections, with a fall of temperature and signs of resolution in the lungs. Brüning criticises his report by saying that repeated injections were necessary, and that in one case recovery did not occur until fourteen days after the beginning of the injections. Further criticisms may be made that the day of the disease is not given in many instances, and that it is therefore impossible to know whether the improvement was due to the serum or not.

Brüning used Römer's serum in six cases, varying in age from eight months to nine years. His results do not confirm the claims made by Crux and Monti. He observed no effect on the pathological condition in the lungs or on the general condition, either subjectively or objectively. He calls attention to the possible danger of the use of foreign serum and of strain on the right heart.

Sill used a polyvalent serum in twelve children, aged between five months and three years, giving one or more injections. All but two were under two years. There were two deaths, one of empyema and one of pneumonia, cardiac failure and marasmus, giving a death rate of 16.6%. Two others were not improved, eight were helped. In some the favorable effect was marked.

Freeman, in 1912, used the serum of the New York Board of Health, which is a polyvalent serum, in fifteen children, whose ages varied between two months and three and one-quarter years. Alternate cases were used as controls. Seven children were given simple pneumococcus serum, receiving 100 c.c. or more, subcutaneously. Eight were given 50 c.c. of pneumococcus serum and 50 c.c. of streptococcus serum at each dose. The mortality in the injected cases was 40% and in the controls 47%. Freeman concluded that the serum apparently affected the course of the disease favorably in some cases, but that it had no effect in others. In most cases there was a better reaction after than before the injections. There was usually a reduction in the number of leucocytes and in the percentage of the polynuclear neutrophils. The injected patients who lived had a much shorter average course than the controls. In some instances the process in the lungs spread, in others it stopped or quickly cleared up. He considers it a safe method of treatment. He thinks that

there is no advantage in the addition of the antistreptococcus serum.

Williams, in 1914, treated twenty-three cases with the serum derived from horses injected with many strains of pneumococci. No attempt was made to determine the strain of organism in the individual case. Six of his patients were children, two of whom died, giving a mortality of 33%. He concludes that the serum has no constant effect on the white cells, and that the study of the results leaves one doubtful of the influence of the serum in modifying favorably the course of the pneumonia.

Dochez and Gillespie, working at the Rockefeller Institute, have divided the pneumococci, by means of immunity reactions, into four main classes, which they term Types I, II and III, and Group IV. Dochez and Avery continued the work of Dochez and Gillespie and found that the pneumococci of the first three types were never present in normal mouths, but that pneumococci of Group IV were present in 80% of normal mouths. Pneumococci of Types I, II and III may, however, be present in the mouths of persons exposed to patients with pneumonia. Organisms of these types disappear in a few weeks after the crisis in pneumonia, and are replaced by the organisms of Group IV. The severest forms of pneumonia result from Types II and III. The average virulence of Type I is lower, while the virulence of Group IV is much lower, and death from it is unusual. Infection in pneumonia is not autogenic from the mouth.

Cole, working at the Rockefeller Institute, found that organisms of Type I were present in 38% of his cases of pneumonia and that the mortality in this series was 25%. Type II was present in 30%, and the mortality was 36%. Type III (mucosus) was present in 11%, and the mortality was 47%. Group IV (heterogenous) were present in 21%, and the mortality was 6%. The mortality in the Pennsylvania Hospital with Type I was 29%; Type II, 27%; Type III, 67%; Group IV, 11%.

These types of organisms seem to be distinct. The serum to be of use, therefore, must be the result of immunization with the organism of the same type. This may be the reason why the results from the serum treatment have been so poor in the past. Serums have been produced by the injection of living organisms of Types I and II into horses which have a high protective power against Types I and II. It has been impossible to produce a serum with any protective power against Type III. Active immune serum can be produced for Group IV, but must be against the individual race of organism. A method has been developed for determining the type of organism from the sputum, or lung puncture, in a few hours. The serum has been used intravenously in large doses, 80 or 90 c.c., twice daily. The results thus far in small series of cases in adults have been encouraging. No children have been treated.

Dunn has found in some investigations, not

yet published, that the organisms present in pneumonia in infants belong almost entirely to Group IV. A possible explanation of the frequency of organisms of Group IV is the slight resistance of babies to infection. It is possible that the low mortality of pneumonia in children may be due to their slighter resistance to infection than adults and consequently more frequent infection with organisms belonging to Group IV, the virulence of the organisms of this group being less than that of the other types.

Other Methods of Treatment. Nothing very new has come up about other methods of treatment in pneumonia in children during this period, unless possibly the treatment with quinine. There is very little about this in relation to children, however, in the literature.

Kilmer, in a paper entitled "The Ambulatory Treatment of Pneumonia in Infants and Young Children," states that there is no objection whatever to bringing children to out-patient departments for treatment daily or every other day, no matter what the weather, and gives statistics of cases treated in the out-patient department in whom the mortality was very low.

Chapin states that in order to reduce the mortality of pneumonia in infancy the patients should be admitted to hospitals earlier and should be discharged promptly, as soon as resolution has taken place. He states that, if they are kept too long, there is constant danger of relapses and reinfection. His plan is to remove infants from the hospital as soon as the acute symptoms have subsided and to board them out in private homes under competent supervision.

Finally, Baginsky, in a paper published this year, calls attention to the strong natural resistance of children to infection. He shows how well they do without any treatment except food and hygiene. He warns young doctors against too vigorous treatment, shows the dangers of doing too much, and closes with the admonition, "Nil nocere."

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Reports of Societies.

BOSTON SURGICAL SOCIETY (INCORPORATED).

MEETING No. 5.

A SPECIAL meeting of the Society was arranged for Wednesday, April 21, 1915, at the Massachusetts General Hospital.

Dr. J. F. Percy of Galesburg, Illinois, demonstrated to the Society the use of his cautery in the treatment of cancer by low heat.

Dr. Percy's paper was published in the BOSTON MEDICAL AND SURGICAL JOURNAL, July 15, 1915.

(Signed)

ROBERT B. GREENOUGH,
Secretary.

MEETING No. 6.

A stated meeting of the Society was held on Monday, October 4, 1915, at the Carney Hospital, as a clinical meeting.

Dr. Bottomley operated for gall-stones and acute cholecystitis, and performed a cholecystectomy.

Dr. Rushmore (by invitation) operated for fibromyoma of the uterus, and performed a complete hysterectomy.

Dr. MacAusland (by invitation) operated for ankylosis of the elbow joint, by division of the olecranon and the transplantation of a fascial flap from the thigh.

Dr. Rushmore (by invitation) operated for ovarian cyst and multiple fibromyomata. He removed the cyst and performed a myomectomy.

Dr. Bottomley demonstrated a case referred for sarcoma of the jaw, which on investigation proved to be actinomycosis, and a mutilating operation was thus avoided.

Dr. Bottomley and Dr. MacAusland (by invitation) then demonstrated a very interesting series of chronic and sub-acute cases of arthritis, which had been previously operated upon with more or less success by ileo-colostomy.

Dr. MacAusland (by invitation) also demonstrated other cases of arthroplasty of the elbow joint, with extremely satisfactory results.

(Signed)

ROBERT B. GREENOUGH,
Secretary.

MEETING No. 7.

A stated meeting was held on Monday, November 1, 1915, at the Boston Medical Library, at 8.20 p.m.

The first paper of the evening was read by Dr. Beth Vincent on Gun-shot Wounds.*

Dr. C. C. Simmons read a paper on Gun-shot Fractures.†

Dr. E. C. Cutler (by invitation) read a paper on Neurological Surgery in a War Hospital.‡

Dr. Walter J. Dodd (by invitation) read a paper on Military X-ray Work.‡

Dr. Walter M. Boothby (by invitation) read a paper on Gun-shot Wounds of the Chest.‡

Dr. Orville F. Rogers, Jr., and Dr. George Benet (by invitation) read a paper on Bacteriology of a War Hospital.‡

(Signed)

ROBERT B. GREENOUGH,
Secretary.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS.

STATED MEETING, HELD MAY 10, 1915.

(Concluded from page 136.)

The President, DR. GERALD B. WEBB, Colorado Springs, Colo., in the Chair.

The Second Annual Meeting of this Association was held at the New Willard Hotel, Washington, D. C. After the meeting of the Council the scientific program was taken up.

THE BLIND DENTAL ABSCESS.

DR. HARRY L. ULRICH of Minneapolis read this paper, which he prefaced by stating that blind dental abscess was rather a loose term though the other names thus far suggested, such as alveolar abscess, periodontal or better still, apical abscess, were not very satisfactory. Apical abscesses were never found at the roots of vital teeth. The pathological anatomy of these areas was not very well understood. The skiagraph indicated a range from a rarifying infiltration to a well defined area of bony necrosis. Extraction of these teeth showed root necrosis and absorption. Microscopic section of these so-called pus sacs showed an outer dense area of connective tissue with infiltrating areas of round cells made up of plasma cells and lymphocytes. Various stages of acute and chronic inflammatory processes were shown. Besides round cell infiltration, polymorphic types were noted. Sections stained for bacteria proved unsuccessful.

At the University of Minnesota Hospital, in an effort to incorporate oral sepsis with sepsis with systemic lesions, special inspection of mouths was made for pyorrhea, gingivitis, caries, and, by means of the x-ray, for apical abscesses. They were struck by the frequency of apical abscesses by studying the roentgenograms of the mouth in a medical x-ray laboratory. The findings were startling. A little over 68% of all artificially devitalized teeth were found with apical abscesses and a total number of abscesses, including those found in pulpless teeth due to caries or death from accident or too proximal fillings, was 83%. In the examination of 500 cases, 1350 dead teeth were found and of these 976 had root canal fillings. Of these cases, 59 with the apical abscess had had bacteriological review and of 107 cases from the university clinic, 100 gave a streptococcus viridans. Fifty-two were from the author's private clinic, and 50 of these gave a viri-

* See JOURNAL, page 153.

† To appear in later issues of the JOURNAL.

dans or a hemolyticus, occasionally mucosa was discovered. Thus 150 of these 500 cases gave evidence of streptococcus, either in pure culture or as the dominant organism. Occasionally the staphylococcus aureus, or albus, or micrococcus catarrhalis was also observed in conjunction with the streptococcus. To the writer the apical abscess was merely another evidence of a focus of streptococcal focal disease, just as the heart, the mucosa of the stomach, the articulations, or the kidneys were evidence of secondary deposits. In other words it was hematogenous in origin. The pathogenicity of these abscesses and their relation to other recurrent foci had had ample clinical verification: First, because acute exacerbation of systemic symptoms followed their removal, that is, focal reactions occurred due to autoinoculation at the time of their reduction; second, acute new systemic systems had followed reduction of these areas; in other words, other foci had been established; third, improvement and sometimes total recession of other focal areas followed the extirpation of these sites; fourth, local and focal reactions occurred with vaccines prepared from apical areas. A recent analysis of 76 cases in which a pseudostreptococcus was isolated from apical pockets showed that 38 cases belonged to the rheumatoid group; six cases to the cardio-vascular group; three to the asthenic, four to the gastro-intestinal, two to the genito-urinary allied to the rheumatoid group. A subgroup of eight cases consisted of those in which the streptococcus focal infection was superimposed on syphilis, tuberculosis, primary anemia, or vice versa. The striking feature of this analysis was the diversity of clinical manifestation for which streptococcus focal infection was responsible. The diversity of symptoms was so marked that he had suggested the term "steptococciosis" for streptococcal focal disease. Experience with alveolar infection in which systemic symptoms were present had made them very cautious concerning the apparently innocent looking tonsil. Invariably the same tonsil, on closer inspection, and particularly after it had been removed under protest, had proven their suspicions correct. To those that were attempting active immunization to disease, it might be the only focus left and might hold the balance of power in the struggle of the body for complete sterilization. In every case of streptococcal focal infection its presence or absence must be established. Such a focus would furnish a material for the preparation of vaccines and much trouble and disappointment from attempting culture from glands and tonsils could thus be avoided.

Of the more striking symptoms in these groups they had manifestations of rheumatoid conditions in 51%; secondary anemia, 43%; heart lesions 47%; tonsils, 40%; pyorrhea, 25%; kidneys (albuminuria and nephritis), 34%; caries, 15.8%.

DR. GEORGE P. SANBORN, Boston, Mass.: In cases of rheumatism or joint infections, I believe it is up to us to find some local infection which is the cause of the trouble. There are many cases met with, however, where it is impossible from the clinical history alone to tell just where the local infection is, and in such cases the use of the x-ray is of great value. I also wish to emphasize the great importance of having men examine the throats, a man who is up-to-date and experienced in his work. I wish to report an interesting case of a chauffeur who, every two or three months, after being exposed to cold weather while driving the automobile, suffered with chills, high fever, and other symptoms which

after a short time disappeared. In looking carefully in the throat nothing could be noted which might be attributed as a cause of his disturbance. A casual examination of the tonsils was made but nothing noted. However, with the use of a tongue depressor, pus was expressed from the side of the tonsil. A tonsillectomy was done and he was then relieved of his rheumatic attacks. It is interesting to note that there may be these foci of infection present and yet give no clinical symptoms.

DR. JUDSON DALAND, Philadelphia, Penn.: I wish to say a word regarding the occurrence of tonsillar infection without any clinical evidences of such a condition being present. Many of us have met with cases where the pus foci were deep in the tissues. In many cases, even after the tonsils were removed, the symptoms will persist and, after very careful search, there would be found a post-tonsillar abscess which they had not been able to find. There seems to be a large number of such cases.

DR. JOSEPH HEAD, Philadelphia, Penn.: I can recall a case where the condition of the tonsil appeared to be all right; the tonsils, however, were removed and yet the joint affection persisted. It then occurred to me that the use of the x-ray might reveal some foci of pus around the roots of the teeth which might account for the symptoms complained of, certain deposits of pus around the roots of the teeth. Was it the tonsil that caused the trouble? I do not wish to have you think that in any way I discredit the value of the paper just read.

DR. CLAUD P. BROWN, Glenolden, Penn.: After doing tonsillectomies there have been left myriads of bacteria, many of a pathogenic nature. After searing the cut parts, inoculation was done; guinea pigs were injected with 2 c.c. of an emulsion and every one so injected died. This seems to prove that the tonsils and the peritonsillar tissues were undoubtedly the habitat of bacterial flora.

DR. A. PARKER HUTCHENS, Toledo, Ohio: I wish to relate a personal experience. I suffered from pyorrhea alveolaris with an occasional "blow up." I also had a severe tonsillitis which I treated with nitrate of silver, sprays, and so forth. An interesting thing was that the tonsillitis always came along when I had an acute exacerbation of the pyorrhea alveolaris. Since the Riggs' disease has been cured by the extraction of certain teeth, I have not since been troubled with tonsillitis.

DR. GERALD B. WEBB, Colorado Springs, Colo.: I would like to ask Dr. Ulrich if the use of the x-ray will enable us to make a diagnosis of pus foci in the apical portion of the teeth.

DR. HENRY L. ULRICH, Minneapolis, Minn.: In closing the discussion I should like to show some pictures which I think are quite characteristic of what I have been speaking of.

With regard to the x-ray interpretation, this is a matter about which we are still at sea; we do not care to extract teeth in order to find out the cause of trouble, but when we have done so we have found pathogenic bacteria. As a matter of fact, after extracting teeth because of abscess formation, and when we have made sections, we did not always find necrosis but the results of ordinary inflammatory conditions. Histologically we have not yet worked out this subject to our satisfaction. There is nothing to be found of value in the literature of this subject. It is of particular interest to know that these abscesses were found so frequently and I believe that many must be secondary and not a primary infection.

THERAPEUTIC INOCULATION IN A GENERAL HOSPITAL;
PERSONAL EXPERIENCE COVERING SEVEN YEARS.

DR. GEORGE P. SANBORN of Boston, Mass., presented this paper. He declared that among the most important problems of the present day in connection with specific treatment of infectious disease in general hospitals was the development of an organization to carry on this important work. That these cases could be treated at present successfully, efficiently, and economically in the various departments in which they occurred was out of the question. The writer said that since his return from the Wright Clinic in 1908 he had made it his chief work to organize a department in the Boston City Hospital which should receive from the various already organized departments suitable cases for active immunization; in order that they might be grouped and thus receive the careful treatment they deserve. It was felt that present and future developments in the specific treatment of infectious diseases would yield a sufficiency of interest and required a sufficient amount of specific detailed laboratory and clinical work to engage the exclusive attention of the department designated for the purpose. At the start in 1908 the activities of this department were limited largely to the out-patient clinic, with the idea of furnishing the greatest good to the greatest number. In connection with the work of others in the same direction it has been the writer's hope to bring forward a sufficient volume of scientific data as to the methods of treatment and as to end results to make possible a more definite standardization of method of vaccine therapy, and a more general acceptance of its efficacy in the treatment of some of the acute, but chiefly the subacute and chronic localized infections. The paper was not intended as an analysis of the cases treated, but to show the amount, character, and scope of the work which was being done with the above end in view. The work of the department included curative vaccine inoculations, prophylactic inoculations against typhoid, salvarsan chemo-therapy and later chemoserm therapy for nerve syphilis. The following data summarized the routine work of the last few years. During this time curative vaccine inoculation had been practised in 994 cases. These patients visited the clinic 6697 times and had received 5880 bacterial vaccine inoculations. As a basis for their treatment more than 650 cultures had been examined, and over 600 vaccines had been prepared. The type and number of cases treated was as follows: Acne, 161 cases; furunculosis, 369 cases; carbuncle, 39 cases; gonorrheal arthritis, 101 cases; tuberculous adenitis 162 cases; other cases of local tuberculosis, 37 cases; superficial pyogenic infections, 49 cases. These conditions had furnished about 75% of all the cases treated. Excepting in tuberculosis and gonorrheal arthritis, it has been the rule to prepare autogenous vaccines for every patient in which proper cultures could be obtained, and this had added greatly to the amount of laboratory work. The results had justified the extra labor. It has been possible to shorten the course of treatment compared to that of 1912 in at least 70% of all cases, the average number of visits per person having dropped from 10.8 visits to 6.7 in 1913 and 1914. It was believed that the regular attendance at the clinic showed the satisfaction of the patients with the treatment and the results. Anti-typhoid inoculation had been applied since June, 1911, to a total of 535 individuals, mostly nurses. Since the introduction of the anti-typhoid inoculation no

nurse had developed typhoid fever in the hospital though there had been two cases developed more than two years after protective inoculation had been given. It was their custom to repeat the inoculation after two years. In the division of chemo-therapy 327 cases of syphilis had been treated. These had visited the clinic 3589 times and had received 954 doses of salvarsan and 608 intramuscular injections of salicylate of mercury. There had been 866 blood specimens taken for Wassermann test, 57 lumbar punctures made for diagnostic purposes and numerous salvarsan injections were given also for diagnosis. The laboratory work had involved the preparation of 954 doses of salvarsan and the solutions necessary for their preparation, and the examination of 57 spinal fluids to determine the question of syphilitic involvement of the nervous system. The cases of syphilis had been mostly in the tertiary stage, in which the requirements were elaborate and had been thoroughly met. The most important aspect of this work had been the early detection of nerve syphilis. Unless intravenous salvarsan of itself might prove to be efficient in the prevention of nerve syphilis, it was reasonable to suppose that in the natural course of events as large if not a larger percentage of cases would be candidates for nerve syphilis unless further preventive measures were applied. This had led to a systematic study of all cases of tertiary syphilis with the possibility of nerve syphilis in mind. It had been the rule to perform lumbar puncture at the beginning of the treatment if consent could be obtained, in order that the spinal fluid could be tested for syphilitic abnormalities. These patients had also been referred to the nerve department for detection of the earliest nerve symptoms. Through the coöperation of the x-ray department, study was being carried on in regard to the involvement of bones and great vessels in the tertiary syphilis. In the treatment of primary and secondary syphilis no reliance had been placed on single doses of salvarsan: the results of following this principle had been most satisfactory. There had been no deaths and no untoward happenings due to the administration of salvarsan. In the treatment of tertiary syphilis in the presence of nerve involvement, the experience of the writer corroborated that of Swift and Ellis and others, in showing this method to be efficient in producing clinical improvement in eliminating in varying degree conditions in the spinal fluid pathognomonic of syphilis. During the past two years the author had treated 150 cases of nerve syphilis to whom had been given 870 injections of salvarsanized serum according to the method of Swift and Ellis. In the hospital clinic 81 cases had been given 348 injections. In summing up, Dr. Sanborn emphasized the advantage of this laboratory whose final interest was special therapy and the advantages of the interrelation of clinic and laboratory, and recommended the establishment of similar departments in all large general hospitals.

THE WOMEN'S MUNICIPAL LEAGUE of Boston is holding this week an exhibit of the different departments of its work in the exhibit room of the Jordan Marsh Company. Education, food sanitation, housing, public health, streets and alleys and the Junior Leagues are represented.

Harvard Medical School.

CHRONIC ULCER OF THE DUODENUM AND STOMACH. DIAGNOSIS AND SURGICAL TREATMENT.*

By chronic ulcer of the duodenum and stomach is understood a loss of substance involving the mucosa, sometimes the muscularis and sometimes the peritoneum. In the immediate neighborhood of this loss of substance there is an indurated area of greater or less extent, depending upon a round celled infiltration. This round celled infiltration serves as a splint to the part, but is one of the factors delaying healing. Because of this delay in repair an increase in the size of the ulcer often takes place and an extension in depth, so that hemorrhage may occur from the involvement of blood vessels in the destructive process. Perforation may take place slowly or extremely rapidly and suddenly.

Chronic ulcer of the stomach and duodenum, then, is characterized by a delay in healing, a tendency to perforate and a tendency to the involvement of large blood vessels, causing serious hemorrhage. In addition to these characteristics, there is the terminal condition of cicatricial contraction, causing deformity of the part, and the still more remote possibility of the development on the ulcer wall of true carcinoma.

Regarding the treatment of such chronic ulcers, there is no doubt that some chronic ulcers of this type may have been cured by medical treatment, but they probably are few. It is difficult for an internist to prove that any ulcer that he thinks he has been treating successfully has completely healed in the first instance, and in the second instance that it was actually a chronic ulcer as defined in the terms above.

The surgeon at the operating table sees results after the ideal medical treatment of these ulcers which do not show the ulcers to be healed under medical treatment.

The diagnosis of chronic ulcer is not difficult in the clear cases. In the doubtful cases the diagnosis may be most difficult. The chief obstacle to diagnosis is the disentangling of the symptoms occasioned by complications consequent upon the involvement of the gall-bladder or the pancreas. Other difficulties lie in the actual presence of adherent organs in the upper right quadrant, or the coincident existence of a chronic appendicitis or pancreatitis. The diagnosis becomes less difficult as the interpretation of the individual symptoms is more and more intelligently made. For example, instead of regarding continual bleeding into the intestine as a sign of cancer only in these gastric cases, we now know that about 5% of chronic ulcers bleed continually. This fact must be taken into consideration in estimating the differential diagnosis of chronic ulcer and malignant disease.

(The obtaining of the diagnosis in chronic ulcer was then dwelt upon, the important points being the clinical story, the tube findings, the x-ray examination, the blood tests, and the examination of the stool.)

The treatment of chronic gastric ulcer is ordinarily surgical. Chronic ulcer of the duodenum is best treated by posterior gastroenterostomy and a moderate infolding of the peritoneum over the

duodenal ulcer. Gastric ulcer is best treated by removal of the ulcer and, if possible, the region of the stomach in the vicinity of the ulcer to the extent of a partial gastrectomy.

(The effect of gastroenterostomy upon gastric ulcer was related. The wisdom of the treatment of gastric ulcer by the actual cautery, when not possible to excise it, was commented upon.)

It was stated that in the small percentage of cases of chronic ulcer, either of the duodenum or of the stomach, treated surgically, which were not cured of all symptoms, such cases must be carefully studied individually before adverse criticism of surgical treatment can be made. That is, in a case of chronic ulcer which post-operatively has certain symptoms, it must be determined what the occasion of these symptoms is in so far as possible, as such symptoms may be due to one or more of many things such as: 1. Post-operative adhesions. 2. A gastro-jejunal ulcer in the stomach. 3. A new ulcer in the stomach or duodenum. 4. A reinfection of an old ulcer. 5. A chronic cholecystitis, with or without gall-stones, overlooked at the time of the operation. 6. A chronic appendicitis. 7. A chronic pancreatitis.)

The surgical treatment of chronic ulcer has been a series of brilliantly successful results. Surgical treatment is not to be chosen as the procedure in supposed cases of chronic ulcer until there is well-established proof that chronic ulcer does exist, and until carefully tried medical treatment has failed to remove the symptoms permanently.

DR. H. F. HEWES: Among the disorders of the stomach which we meet with in clinical practice, we have two distinct groups of cases.

1. Conditions of disorder associated with actual disease of the stomach itself.

2. Conditions of disorder of the stomach appearing as disturbance of the stomach functions, or giving symptoms attributed to the stomach, which are manifestations of actual disease elsewhere, as gall-bladder trouble, appendix trouble, heart trouble, tuberculosis, etc.

In the first group we may consider the following entities: Cancer of the esophagus or stomach, ulcer of the stomach, acute and chronic gastritis, simple hyperacidity, adhesions involving the stomach or affecting its function, debilitated stomach, such as is seen with or after exhausting disease, as typhoid, influenza, etc., misused stomachs associated with improper hygiene, nervous dyspepsia, and rare conditions of malformation of the organ, or syphilis of the stomach, or sarcoma.

In all cases the first step in diagnosis is the determination, as far as possible, as to whether or not we are dealing with a real stomach disease, primary in the stomach, or with a disorder which is simply a sign of disease elsewhere. Often the record of the case or the results of general physical examination will enlighten us on this point, discovering the existence of appendix trouble, or pulmonary tuberculosis, or cerebral arteriosclerosis.

Once we have ruled out probable trouble elsewhere, we settle ourselves to determine which of the above stomach entities we are dealing with, using the records of history, physical examination, special tube examination, feces examination, or x-ray examination to aid in our research.

The following is a brief summary of the usual symptomatology found associated with these various definite stomach disorders. (This summary

* Abstract of lectures at Harvard Medical School, Jan. 11, 1916.

appeared in the article by Dr. Hewes on "A Study of Disturbances of the Stomach," published in the *JOURNAL*, Vol. CLXII, pp. 286, 338, 370, 406.)

In regard to the treatment of cancer of the stomach, all that we can say is that surgery should be employed wherever it seems possible that it will do any good. Some cases we may get at a comparatively early stage, and accomplish a cure by partial gastrectomy. In other cases our treatment may be only palliative, but it will add much to the comfort of the patient.

The treatment of bleeding ulcer of the stomach should be medical in the first instance. It should consist of the employment of a simple diet, given in small amounts at frequent intervals. It matters little whether we employ the diet used here, of crackers and milk, or that used so much in Europe, of egg white and milk, or the diet of milk and cream. Beginning with 1 to 2 ounces every hour, we finally get to 6 to 8 ounces every two to three hours. Later we add mashed potato, macaroni, custard, ice cream, cereals, soft toast, eggs. Bicarbonate of soda or a mixture of bismuth and soda may be given. In convalescence I give paraffin oil regularly. Care about diet and in regard to proper hygiene should be continued for months in these cases. The same treatment is to be utilized in cases of fresh duodenal ulcer.

In chronic ulcer of the stomach the treatment is surgery, and the proper surgery is resection, with gastro-enterostomy. Some of these conditions develop cancer later, and it seems the best judgment always to remove the lesion rather than to temporize with it.

In the treatment of chronic duodenal ulcer, I advise medical methods in some cases and surgical procedure in others. There can be no fixed rule for the selection of treatment in the various cases.

As a rule, surgery is to be advised in all cases where there is evidence of obstruction, either marked obstruction, as evidenced by the finding of a twelve-hour food residue, or moderate obstruction, as evidenced by the finding of a six-hour bismuth stasis of any amount. Cases of ulcer with no bismuth stasis, I subject to medical treatment in the first instance. Many cases of this type do quite as well under medical treatment as the average case does under surgical treatment. Where comfort cannot be secured by medical treatment, surgery can finally be employed.

The medical treatment employed consists of the use of a mild diet, consisting of soft-boiled eggs, toast, wheat cereals, milk, potato, macaroni, rice, simple puddings, potato, pea or bean purée, crackers and milk. Five or six meals daily should be given. In addition give paraffin oil, and if necessary, bismuth and soda.

The treatment of adhesions involving the stomach varies with the case. Often we secure good results by the employment of the same medical treatment just described in the consideration of chronic duodenal ulcer. In other cases we are forced to resort to surgery. If surgery is used in these cases it should be radical, including gastroenterostomy or short-circuiting, not, as a rule, simply the separation of adhesions.

The treatment of hyperacidity and of chronic gastritis will be considered at another exercise.

In addition to these above mentioned actual diseases of the stomach, we have to deal with some other conditions not actually those of stomach dis-

ease but of functional disturbance of the stomach, notably conditions of debilitated stomach and of nervous dyspepsia.

Debilitated Stomach. In patients who are run down or overworked, or patients suffering from diseases which lower vital force, as typhoid, influenza, tuberculosis, we often have what can best be described as weakness of the stomach,—inability to take care of regular diet without symptoms of distress or discomfort. There is no regular symptomatology in these cases. Sometimes there is a sense of heaviness in the stomach soon after eating, with a tendency to feel distended and to raise gas. Sometimes the discomfort comes long after eating. Sometimes there is regurgitation of food. In bad cases there may be vomiting.

The treatment of these cases varies with the case. The general principle is that of giving a diet composed of food easily taken care of by the stomach, divided into several small single meals. For example, breakfast, 1 egg and 1 slice of toast or a saucer of cereal; 10-11 a.m., cracker or milk or hot bouillon and crackers; 1 p.m., mashed potato, rice or macaroni; 4 p.m., crackers and milk or egg and milk; 6 p.m. toast and simple pudding. Solid food is often better borne in such cases than liquid foods. Often we find that these patients eat almost nothing. They need plenty of food, and improve only when they get it.

The symptoms may be treated by giving bicarbonate of soda, a half teaspoonful at the time of distress; or, if this fails of relief, spirits of peppermint or capsicum. Tincture of nux vomica may be used before meals.

Nervous dyspepsia is a term used to describe certain cases with stomach symptoms, where these symptoms are part and parcel of a condition of nerve instability, or of over-strained nerve condition, or of a mental condition where the mind is very much on the stomach. Treatment of such cases is principally the treatment of the underlying nerve conditions. Removal from conditions of worry, inculcation of proper habits of living, direct attention to treatment of the stomach, if only for the mental effect upon the patient, should be given. A diet should be written out. Often such patients do better on a good diet with meat, vegetables, etc., than on what is known as a diet of slop. Drugs may be useful, principally for their mental or reflex effect. Sometimes an initial exhibition of bromide for a time helps to start the patient right. Often the real trouble with these patients is constipation or a tendency to sluggishness of the intestines. Paraffin oil taken regularly relieves them.

DR. C. A. PORTER: I have endeavored to find statistics which will show the frequency with which chronic ulcer degenerates into cancer. The variation is very great and apparently depends upon the sort of case studied, and the point of view of the individual observer. In 1901, Mayo Robson stated that 59% of his cancer cases gave definite histories of chronic, intermittent attacks of indigestion. Smithies and Ochsner, in their book on "Cancer of the Stomach," tell us that of 921 cases, 47% gave definite symptoms of past dyspepsia of the peptic ulcer type. Wilson and McCarthy, from operative material examined at the Mayo Clinic, gave 71% as the proportion of cancer on ulcer. Lockwood does not agree with such figures, and found, in 146 cases, only 7% with histories of previous indigestion. He has traced, so far as possible, his ulcer

cases for the past twenty years, and believes that not more than 4% have symptoms suggesting malignancy. Smithies tells us that 32% of his series gave no history whatever of any previous gastric disturbance. We see, therefore, that even in such a common and well-known disease as gastric cancer, there is a difference of opinion between the internist and the surgeon on a very important, almost vital matter. I use the word vital because Smithies states that by the time the surgeon opened the abdomen of a patient diagnosed as cancer of the stomach, the lymph nodes were found already involved in 71%, the growth being at the pylorus or lesser curvature near the pylorus in 66%; in other words, in a part of the stomach most easily resected, also in that portion of the stomach most frequently affected with chronic ulcer. I will not go into methods of gastric diagnosis except to say that in a very large proportion of cases the diagnosis can be made with great accuracy, but at a stage too late for cure. It seems to me that laparotomy should be done when, in a patient of cancer age, a good internist fears the possibility of cancer of the stomach.

The surgical treatment of gastric cancer divides itself into three methods: preventive; radical, with a hope of cure; and admittedly palliative. Preventive treatment must depend upon the point of view of the surgeon as regards the subject already mentioned—cancer on ulcer. The mortality of pylorectomy varies with the skill and experience of the surgeon performing the operation, and is not the mortality of the best surgeons in the largest clinics. It may be estimated at from 5-15%,—in easy cases the lower figure or less; in difficult cases, or those in poor condition, nearer the upper figure. Whether simple gastroenterostomy with or without closure of the pylorus will heal the ulcer and prevent further malignant degeneration will probably be settled before long by accumulating statistics. A definite percentage of the pylorectomies done for what seemed clearly a chronic ulcer, have turned out, upon careful examination, to be cases of early cancer. The surgeon who might have done, in these cases, a pylorectomy, and instead does a conservative operation, is responsible, in a way, for the future outcome of this case. In other words, the surgeon doing, as a routine, conservative operations, will have a small operative mortality. The surgeon doing pylorectomy will have a larger primary mortality. What the ultimate outcome will be in the saving of deaths from cancer later remains a problem not yet thoroughly worked out and settled from the point of view of the surgeon.

Radical cure of cancer of the stomach: Smithies states that of a series of radical operations, 22% have lived from 2 to 5 years after radical operation; that from 10 to 20% have good hope of cure, about the same as the mortality of operation on the average case of cancer.

While I am a firm believer in early exploration in cases of doubt, it is clear that every effort should be made never to do even an exploratory operation in far advanced cases or in those in which a palliative operation is not indicated. The x-rays give us valuable information as to the extent of the lesion. A large immovable tumor with other symptoms and signs of cancer, without stasis, particularly contraindicates even an exploratory operation. Malignant glands in the left supraclavicular space show the incurability of the disease, and the surgeon has to consider only the advisability of

a palliative operation. Ascites, involvement of the liver, metastasis in the bones, peritoneal carcinosis in the posterior cul-de-sac, as shown by rectal or vaginal examination, contraindicate, as a rule, even exploration.

The palliative operations are two,—partial gastrectomy to relieve cachexia, vomiting, hemorrhage, pain, etc., and drainage operations. There can be no doubt that in comfort and longer life, incurable patients who survive gastrectomy are definitely benefited. Whether these operations should or should not be done, depends upon the mortality of the individual surgeon and the conditions of the individual case. Some approach a palliative operation with timidity who are willing to take big risks so long as a cure is possible. Gastroenterostomy is definitely beneficial where the cancer has caused obstruction and starvation. It is surprising to see how some of these cases with numerous malignant glands put on weight, and almost make one question the accuracy of the diagnosis. Anterior gastroenterostomy in my hands, in these cases, has been almost as satisfactory as posterior, and is more easily and more quickly done in many. It is a question which must be decided again in each case, whether gastroenterostomy should be done to anticipate subsequent obstruction. Drainage operations, where there is no obstruction, and where the patient is run down from pain and cachexia, have seemed to me unsatisfactory. A two-stage operation is clearly of value in some cases. If the mortality from cancer of the stomach is to be diminished, earlier explorations must be done. If subsequent investigations prove that cancer on ulcer is anywhere near as common as some statistics seem to show, pylorectomy rather than gastroenterostomy, with or without burning of the ulcer, should be done more frequently in favorable cases. Attempts at radical cure carry with them, of necessity, a high mortality—probably about equal to the percentage of cures. Every surgeon must determine his duty in these cases, influenced by statistics, his own results, and the point of view of the patient.

PAPER OF DR. DANIEL F. JONES.

DISEASES OF COLON AND RECTUM.

DR. DANIEL F. JONES: It should be understood that "replacing" external hemorrhoids is a stupid procedure, because they do not belong inside the sphincter and will not stay there.

There are three procedures which may be followed in treating internal piles: (1) Clamp and cauterize. (2) Ligature. (3) Whitehead operation. Of these, long experience shows that the clamp and cauterize is the best for weak patients, and is as good, if not better, than other methods in its end results on all types of patients. The trouble with the ligature method is that the needle may enter a venous sinus and give rise to a serious thrombosis. The Whitehead operation is more complicated and thorough than the other methods, but does not prove more advantageous in point of recurrence, and often occasions much discomfort in the form of itching and moisture about the anus.

Fistula.—The old method of cleansing with a probe and iodine or some caustic substance does not give good results, and the fistula is almost sure to continue. The method of cutting across the sphincter at right angles, slitting open the fistula and allowing granulation to heal from below is the best.

The Elting procedure is to pull down a portion of the rectal mucosa over the internal opening. It is practical but rather complicated for non-expert hands.

Fissure.—Two methods are in vogue. In Boston, stretching the sphincter has proved adequate and safe during many years. In New York, stretching is considered bad technic, and the preference is given to incision in the sphincter in the region of the anococcygeal ligament.

Colitis.—The condition commonly called colitis is one which requires much study before a definite diagnosis can be made. Colitis may be bacillary, amebic, specific, tuberculous, or catarrhal in origin. A chronic appendix *per se* rarely, if ever, results in mucous colitis; it is the chronic appendix with adhesions which causes colitis. Though simple mucous colitis often comes from adhesions, adhesions do not necessarily always produce a mucous colitis. Colitis produces a characteristic picture in the sigmoid and rectum; malignant disease of the colon, tuberculous ulcer or ulcerative colitis may not. Hence the value of proctoscopy in ruling out colitis in questionable cases.

It is necessary and important to go on slight evidence in the diagnosis of diseases of the colon.

Cancer of the Colon.—Early cancer of the colon lends itself so remarkably to surgical cure that it is most important to make the diagnosis early. The signs are often misleading. The stools may not give a positive guaiac test even though blood and mucus be passed in the stool. The movements are often frequent and small. The x-ray is extremely misleading often, and should be taken more thoroughly. The proctoscope should be used. Small blood clots are highly suggestive. Operation (exploratory) should be done in suggestive cases.

Cancer of Rectum.—The results of operation are horrible. Forty per cent. of cases living five years after operation is a misleading figure; 6-10% of total number of cases seen is more accurate. The symptoms are late. Women put off any examination. Physicians do not make enough rectal examinations, and the defense that "patients won't stand for it," brands the physician who makes such apology.

Remember that though a healthy person may say, and the physician himself believe, that death is preferable to life with a colostomy, the patient will be willing to keep his life on terms not considered endurable.

Prolapse of the Rectum.—The anterior rectal wall bulges as a result of what should be regarded as a hernia of the posterior cul-de-sac. In women such a hernia of the pouch of Douglas is often called incorrectly a rectocele. The treatment should here be patterned on the treatment of hernia; the posterior cul-de-sac should be ligated high up.

A. GREGG, A.B.

EXHIBITION OF CASES.

DR. JOHN HOMANS: A case illustrating the differential diagnosis between perirenal abscess and retrocecal appendicitis.

PAPER OF DR. GILBERT HORRAX.

EXPERIMENTAL AND CLINICAL OBSERVATIONS ON THE PINEAL GLAND.

The results of recent investigation of the pineal body point very strongly toward its being a gland of clinical significance. A case of tumor of the pineal, about to be reported from the Surgical Service of the Peter Bent Brigham Hospital, showed the typical syndrome of Frankl-Hochwart, namely, signs of precocious adolescence combined with general pressure symptoms. At autopsy a diffuse struma of the pineal, very similar to a carcinoma, was demonstrated.

Experimentally, the problem of extirpating the epiphysis has been attacked by several investigators, notably Foa and Sarteschi. They reported much more rapid development of the primary and secondary sex characters in pinealectomized chickens and rats, respectively, over controls of the same litters.

Pinealectomy was carried out on a series of guinea-pigs in the Laboratory of Surgical Research at the Harvard Medical School during 1914-1915. Litters of young pigs, varying in age from four or five days to several weeks, were used, the controls being subjected to a similar operation as the experimental animals, except that the gland was not extirpated. Of the 144 experimental and control pigs, 90 survived; and of these, 20 females and 15 males were found to have been completely pinealectomized. The males showed an increase in size of both testes and seminal vesicles over their controls, the weight of the former averaging 854 mg. to the controls' 663 mg.; and of the latter, 763 mg. to the controls' 466 mg. Microscopically, the testes and seminal vesicles of the pinealectomized animals showed a more advanced picture than those of the controls. No changes were demonstrated in the females.

PAPER OF DR. W. W. CADBURY.

MEDICINE AS PRACTICED BY THE CHINESE.

There is a large element of superstition connected with the medical practice. It is based on a positive and negative principle, called the *yang* and the *yin*. Since anatomical dissections have been prohibited in the past, a very crude conception of human anatomy prevails.

The palpation of the pulse is the essential method of making a diagnosis. The pulses of both the patient's wrists are felt, the physician palpating with three fingers.

Many herbs and drugs are used. It is significant that ox-bile has long been used for jaundice; and other useful remedies,—rhubarb, pomegranate root, aconite, opium, arsenic, sulphur and mercury,—are found in the Chinese materia medica.

No surgery, in the modern sense of the word, is practiced by the Chinese physician.

Western medicine and surgery are rapidly coming to be recognized by the Chinese as having great superiority over their own primitive methods.

ERNEST G. GREY, M.D.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, JAN. 18, 1916, AT 8.15 O'CLOCK.

The President, DR. HENRY A. CHRISTIAN, in the Chair.

Book Reviews.

A Manual of Pharmacology. By WALTER E. DIXON, F.R.S., M.A., M.D., B.S., B.Sc., D.P.H., Professor of Materia Medica and Pharmacology at King's College, London; University Lecturer in Pharmacology, Cambridge; Examiner in Pharmacology in the Universities of Oxford and Cambridge, etc. Fourth edition completely revised. London: Edward Arnold, 1915.

The author, in a clear and condensed form, has given us a work which, as far as its technical value goes, will be of great value to students and physicians.

It begins, as do most other works of this character, with an explanation of the metric system, which at this late day, seemingly ought to be taught in the secondary schools rather than in medical schools and medical works. A succinct presentation of the character and action of alcohol follows, with a rather humorous explanation of its influence in arousing "Dutch courage" and "The brilliancy of the after-dinner speaker." The author regards it as a food in limited quantities, that is restricted to the ability of the body to oxidize it, because it acts as a sparer of fat and also of protein.

A group of excellent tracings of the action on the heart and pulse by different drugs is included, as well as a series of drawings illustrating the physiological action of drugs on the normal organ.

Preparations and doses follow the description of each drug, but being taken from the British Pharmacopoeia, often fail to find their equivalent in the United States volume of the same character. The newer drugs, such as valiolol and veronal, are fully described and their action given in full.

But scanty mention is given of the theobromin group and their combinations, with sodium salicylate and sodium citrate, many of which have earned the justifiable regard of practitioners for their power to lower the blood pressure.

The author's views coincide with those of many others in regard to the unreliability of the various alkaloids which have been isolated from digitalis and recommends the old method, preparations of infusion and tincture.

Many of the preparations of the heavy metals—lead, copper and zinc, which are now being used less and less in medicine, are given equal importance with other drugs which still maintain their valuable properties in the mind of the physician.

Serum therapy and animal extracts are carefully described and the restrictions in regard to their use fully enunciated.

It seems rather strange, however, considering the immense value of anti-typhoid vaccine as

shown by its successful use in the armies of the world, that it is referred to by the author as of doubtful value.

An excellent index closes the work, and as far as orientation with reference to the basic principles of organic therapy goes, no work offers greater facilities.

The Practical Medicine Series. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. Vol. VI, General Medicine, edited by FRANK BILLINGS, M.S., M.D., and J. H. SALISBURY, A.M., M.D. Vol. VII, Obstetrics, edited by JOSEPH B. DELEE, A.M., M.D., with the collaboration of HERBERT M. STOWE, M.D. Chicago: The Year Book Publishers, 1915.

These two volumes, appearing simultaneously in the Practical Medicine Series for 1915, continue the presentation of a summary of progress in their respective fields during the preceding year.

The volume on general medicine is concerned chiefly with diseases of the alimentary tract, especially the stomach and intestines. The remainder of the volume is devoted to the infectious diseases. The work is illustrated with eight full-page plates and nineteen text cuts.

The volume on obstetrics makes a greater attempt at completeness and is divided under the headings of pregnancy, labor, puerperium and the new-born infant. Especial attention is devoted to pregnancy toxemia and twilight sleep. The book is illustrated with seven full-page plates, illustrating operative technique, and one text cut showing the plan of an infant incubator.

Both these volumes should be of distinct value and interest in summarizing recent progress for the benefit of the general practitioner.

Physical Diagnosis. By RICHARD C. CABOT, M.D., Assistant Professor of Medicine in Harvard University, Chief of the West Medical Service at the Massachusetts General Hospital. Sixth edition. New York: William Wood and Company, 1915.

The first edition of this book appeared in 1905. The appearance of the sixth edition ten years later is sufficient comment on its popularity, and the popularity is richly deserved. Dr. Cabot has a gift of simple and clear expression of his keen and straightforward observations and deductions. In the sixth edition the essential changes are in the section on the diseases of the heart. The recent advances in our knowledge of cardiac disease, which have been made possible by cardiographic methods, are adequately discussed. Substantial changes have been made in the section on diseases of the lung. The other sections present changes in proportion to medical advances.

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MEDICAL PREPAREDNESS.

THE three-day convention of the National Security League, recently held in Washington, served to present to the country in a definite way the views of those who insist upon preparedness. Although there are many who honestly believe that preparation for war is a temptation to fight, the majority of citizens of the United States would probably vote in favor of a more adequate national defense.

Next to the army and the navy, and perhaps equally with the railroad service, the medical profession is directly concerned with this question. Medicine bears upon the problem at many points. By the examination of recruits, the medical man insures fit material for the army and navy. Whenever numbers of men gather in camps, sanitation becomes of the greatest importance. Even with an army inactive, accidents are constantly occurring which demand a

high type of surgical skill. If there is fighting, the medical corps must not only look after the personal hygiene of the men to keep them up to their greatest efficiency, but must render first aid, care for the wounded during transportation, and in hospitals far from the front and at times long after the battle, strive to make of the wounded man a healthy soldier or a self-supporting citizen.

The preceding points were brought out by Major Noble, of the U. S. A. Medical Corps, in his address to the Aesculapian Club on January eighth. Of an army engaged in war, the speaker said, the proportion of men sick or wounded comes to about 10%. Thus with an army of only 200,000, hospital facilities must be provided for 80,000.

In other words, 160 hospitals of 500 beds each would be required, and should be manned by surgeons and physicians of experience, assisted by specialists, such as radiographers, neurologists and dentists.

The work done at the front requires less surgical skill. There, the efforts of the medical man must be more in the direction of sanitation and the personal hygiene of the men. The free use of common sense based on a knowledge of medical facts will go far, but to be really efficient a man in this position should have some special military training such as is offered at Tobyhanna or by the correspondence courses given by the U. S. Government to members of the Medical Reserve Corps.

For the successful pursuit of surgery in a military hospital, on the other hand, a special knowledge of military matters is not, we believe, especially important. The principles of military surgery are not in any way different from those of civil practice. The conditions met with in wounds received in war are, it is true, rather different from the surgical problems encountered in times of peace. The former are unfamiliar to most surgeons because they are traumatic and potentially infected, whereas the majority of surgeons deal with wounds of their own infection made under aseptic conditions. The principles of cleanliness and drainage applied to military surgery will bring good results, and the surgeon quickly becomes acquainted with minor differences. A competent surgeon very soon finds himself on his feet, so to speak, in a military hospital, and better results can be obtained by good surgeons skilled only in civil practice than by poor surgeons of military training.

The organization of such hospitals seems to be the most difficult part of the problem. For that reason the scheme suggested by Dr. George W. Crile, at the Clinical Congress of Surgeons, for the organization on paper of separate hospital units which may be assembled rapidly when needed, seems worthy of consideration. It is to be expected that the government will before long issue a definite policy for the reinforcement of the Army Medical Corps, either through the increase of the Medical Reserve Corps or by the formation of hospital units. When the way is indicated, it goes without saying that the medical profession will respond with the whole-heartedness with which it has served its country in the past.

PETER BENT BRIGHAM HOSPITAL.

THE first annual report of the Peter Bent Brigham Hospital contains a report of the work from the opening of the Hospital, March 31, 1913, to January 1, 1915. During the year 1913, 681 medical cases and 689 surgical cases were admitted; in 1914, 1391 medical and 1452 surgical cases. The Out-Door Department is open to receive patients from six in the morning until eight in the evening. It is interesting to notice that during the first six months, more patients came in the afternoon than in the morning, but during the second year, the morning hours had more than double the number of calls compared with the afternoon hours. The dietary department is worthy of special mention. The staff prescribe the units of nutrition that they wish administered to the patients. The dietitian works out the actual food that the patients have and reports back to the physician how she has accomplished the work. This leaves the dietitian free to use whatever seems best to meet the ends that the physician wishes accomplished, and had led to very good work with a class of diabetics in the out-door department. Lectures have been given to these diabetics, and the class has proven so successful that the out-door department is now contemplating forming a class in kidney troubles and another in heart lesions.

The beds of the hospital have been equally divided between medicine and surgery and the organization of the two services is similar. All of the officers serve throughout the year. The surgeon-in-chief gives his full working time to his hospital and medical school duties. His two

junior associates give the major part of their time, and when provision is made for them to have their own rooms in the institution they will undoubtedly give their undivided individual service. There are four salaried senior house officers of indefinite term of service—a resident surgeon and his three assistant residents, one of whom devotes himself for a year to the special field of neurological surgery and is directly responsible, in this work, to the surgeon-in-chief. Under these men come the eight house officers who are appointed in pairs every four months and serve for sixteen months; and under them, in turn, students serve as clinical dressers in the wards. The first patient was admitted to the surgical department on January 27, 1913. In the twenty-four succeeding months there were 2284 admissions, the average of the last three months being about 150 patients a month. The first patient in the medical service was admitted on March 31, 1913, and to December 31, 1914, there were 2110 admissions. Of this number 438 were readmissions. The condition of the 1613 patients who were discharged from the service during this period was as follows: Well, 182; improved, 817; unimproved, 361; untreated, 119; dead, 134.

TUBERCULOSIS LEGISLATION.

THERE are at present pending before the National and the Massachusetts Legislatures several proposed measures dealing with the care and control of tuberculosis, which deserve consideration at this time in view of the importance of the subject with which they deal.

Before the Federal House of Representatives there has been introduced by one of the congressmen of Massachusetts a bill aiming to standardize and to establish uniformity of method in the conflict with tuberculosis throughout the United States. The essence of the bill is contained in its following provisions:

"That the Secretary of the Treasury be, and he is hereby authorized to provide care and treatment for persons afflicted with tuberculosis, who are citizens of the United States, even though they may not be legal residents of the State in which they are temporarily located. That the Secretary of the Treasury shall have power to designate certain institutions in each State to receive such patients, said institutions to be subject to inspection by the public health

service of the United States. That the Secretary of the Treasury is hereby authorized to reimburse such qualified institutions a certain sum of money, not exceeding \$1 a day, for each patient admitted with the approval of the Secretary of the Treasury. That this act shall take effect upon its passage."

It appears that this bill is intended to be a national extension of similar measures that have already been passed in several states. It embodies and provides for a form of national subsidy of state institutions similar to the state subsidy of local institutions now in effect in this Commonwealth. Though we are disposed not to approve of this principle of subsidy, it has in fact seemed to work well and not without justice in this community. Whether its extension may or may not be desirable, it seems that a centralization of control in dealing with tuberculosis throughout the country may be desirable and should, in part, be obtained by this proposed legislation.

Before the General Court of Massachusetts there have been introduced two bills (House Nos. 322 and 323) under the auspices and responsibility of the Massachusetts Association of Boards of Health. Both these proposed measures are intended to deal with incorrigible and wilfully careless tuberculates and to provide a means by which they may be isolated in order to prevent them from further spreading the disease. The text of these two bills is as follows:

The first relates to the removal of persons infected with tuberculosis.

"Section 1. Whenever it shall appear to the State Department of Health or to the board of health of a city or town that, by reason of improper care, improper household conditions, or improper habits, the condition of a person suffering from tuberculosis is such as to endanger such person or his family or the public, and that the conduct of such person with regard to his health is not governed in accordance with the advice of a person competent to advise with regard thereto, such board of health may request the justice of the police, municipal or district court having jurisdiction in the district wherein such person resides to order his removal either to some proper institution for the care of tuberculous patients in the locality in which the patient resides, or to some such institution maintained by the State. If the magistrate is satisfied, after such investigation as he may deem proper, that it is necessary or desirable for the welfare of the patient or his family or the public that he shall be so removed, an order shall issue from said court which shall authorize and instruct any constable, police officer or other

agent to whom it may be directed to take custody of and remove such patient to the designated place, and to incur any necessary expense in connection therewith, including reasonable fees for the removing agent, such expense to be paid by the board requesting such removal. After such removal, the officer or agent making the same shall file such order, with his return thereon, with the court from which it issued. The person so removed shall remain in the institution until discharged by the authorities in charge thereof; and the officer in charge of such institution shall have authority to restrain the patient therein and to enforce compliance with the rules and regulations thereof; provided, however, that whenever the patient shall so request, in writing, the authorities in charge of said institution shall notify the justice of the court which has taken original cognizance of the case of the desire of such person to be discharged; and thereupon, after hearing, the court may order such discharge or take such action with regard thereto as may be deemed expedient, but the patient shall have the right to appeal to the Superior Court as in the case of crimes and misdemeanors. Any authority in charge of such institution shall, upon failure to communicate the request of a patient, as herein provided, be deemed in contempt of the court having jurisdiction.

"Section 2. In case any inmate of a sanatorium or hospital for the care and treatment of persons ill with tuberculosis persists in disobeying the rules of such institution and defying the orders of its officers, or conducts himself in such manner as to endanger the health or comfort of the other inmates, or the discipline of the hospital, the officer in charge of such institution may petition the police, municipal or district court having jurisdiction where said institution is located, and, in accordance with the provisions of the preceding section, the magistrate having jurisdiction may order the removal of such patient to any institution maintained by the State for the care and control of unruly or incorrigible tuberculous patients.

"Section 3. If it shall appear that the patient removed under the preceding sections is able to pay the cost of his care therein, or any part thereof, the magistrate ordering the removal shall order and require the patient to make such payment, and, upon failure so to do, the board of health or officer requesting such removal may bring civil action against the patient, in the ordinary manner provided by law, to recover the amount stipulated in the order.

"Section 4. Any action taken hereunder shall be in no wise considered a record of crime or misdemeanor against the patient involved.

"Section 5. This Act shall take effect upon its passage."

The second bill deals with the care and treatment of incorrigible tuberculous patients:

"Section 1. The trustees of hospitals for consumptives, subject to the approval of the governor, are hereby authorized to take, in the name and for the use of the Commonwealth, land in fee by right of eminent domain or to purchase the same; and to erect and maintain on such lands, or upon lands previously taken for the maintenance of sanatoria, a hospital or hospitals for the custody, care and treatment of incorrigible and careless tuberculous patients, and for this purpose may expend a sum not exceeding dollars.

"Section 2. Within sixty days after any land is taken under the provisions of this Act, the said trustees shall file and cause to be recorded in the registry of deeds for the county in which such land is situated a description thereof, sufficiently accurate for its identification, together with a statement of the purpose for which same is taken, which description shall be signed by a majority of said trustees; and such recording shall operate as a taking of the real estate therein described.

"Section 3. The trustees of hospitals for consumptives shall from the appropriation made for such purpose, pay all damages sustained by any person, firm or corporation by such taking under the authority of this Act. Any person, firm or corporation sustaining damages as aforesaid who fails to agree with said trustees as to the amount thereof, may have the same assessed and determined in the manner provided by law in the case of land taken for the laying out of highways, on application at any time within three years after the taking of such land in the manner above prescribed, but no such application shall be made after the expiration of said three years.

"Section 4. This Act shall take effect upon its passage."

Taken together these two measures should provide an effective means for dealing with the problem in question. Nearly identical bills were previously recommended by the recess committee of the legislature on tuberculosis, but failed to pass. In an opinion before this committee two years ago the attorney-general stated that further legislation on this subject should be enacted to make the law clear and unmistakable in regard to forcible isolation. The safeguarding of the community, the protection of those in health, and the prevention and ultimate control of the disease demand the passage of these measures. Individual physicians should not only approve these bills but should give their personal aid in securing their passage by writing to their senators and representatives, emphasizing their opinion of the need and importance of such legislation.

BOSTON LYING-IN HOSPITAL.

THE BOSTON LYING-IN HOSPITAL has recently issued an attractive pamphlet presenting a view of its proposed new building and outlining the history and present needs of the institution.

The Hospital was originally incorporated in 1832. It 1853 it was removed to a new building on Springfield street, now occupied by the Old Men's Home. Twenty years later it removed again to the present building at 24 McLean street, where its equipment has from time to time been enlarged by the purchase of additional houses and finally by the acquisition of the building of the Samaritan Hospital, on the corner of McLean and Chambers streets. At its various locations the hospital, since its inception, has cared for over twenty-two thousand women in its wards and over forty-five thousand in its out-patient department. During this same period, over six hundred nurses have studied in its training school, and two hundred and fifty house officers have graduated with its diploma.

Though the hospital has been remodeled from time to time and though the quality of its work has always been maintained at the highest level, despite occasional inadequacies of equipment, it is felt to be high time that the institution should have a building and organization adequate for its needs, equal to the best of modern standards and making it possible for the institution to perform the full amount of service of which it is capable which hitherto has been inevitably limited by its means and facilities. A site of land has, therefore, already been selected and purchased on the corner of Pasteur and Longwood avenues, opposite the Harvard Medical School, and tentative plans and designs have been drawn. This projected new hospital building will contain larger accommodations for patients, nurses, house officers and employees and will make the capacity of the hospital sufficient to meet the constantly increasing demand which is made upon it. The trustees confidently believe that the needs of the hospital are so deserving and that the larger service which it can thus render to the community is such that friends of the institution will freely contribute the funds required. A total sum of approximately \$500,000 is needed to provide a building and equipment adequate to the necessities of the institution, about one-half of this being required for the main hospital, the remainder for a nurses' home, private ward, power plant and

laundry. It is desired by the trustees, who have in hand the raising of this money, that portions of this sum should be subscribed in the form of memorial gifts, for which the following suggestions are offered: memorial ward (\$25,000), main operating room (\$15,000), memorial hall and lecture room (\$10,000), private room (\$7,500), memorial bed, small operating room, laboratory, garden and grounds (\$5,000 each). Other desirable endowments are a premature ward, library, nursery, museum and reading room. There is also need of a research fund of from \$5,000 to \$20,000.

The interest of the profession should be keenly concerned in these new plans for the Boston Lying-In Hospital. The work which this institution has done and its potential capacity for the future entitle it to adequate establishment with the other medical institutions in the hospital community developed about the Harvard Medical School. Contributors to the new building fund, or any who wish further information in regard to the plans of the hospital, should communicate with Dr. J. Collins Warren, 58 Beacon street, or with Mr. James R. Hooper, 87 Milk street, Boston.

MEDICAL NOTES.

THE RELATION OF FUR TO ANTHRAX.—In connection with a recent death from anthrax in New York, a question arose as to whether the disease might have been due to the wearing of an infected fur neckpiece. In the absence of any other definite clue as to the origin of this case, a fur collar which had been worn by the patient just prior to the development of her disease was suggested as being possibly responsible for the transmission of anthrax. This suggestion, which received considerable notice in the public press, caused a certain amount of apprehension among persons who wore furs.

While it has been proved again and again, that anthrax may develop among those who handle raw hides, among wool sorters, workers in mohair, and those who handle raw bristles as well, no authentic case of anthrax has ever been reported in one who had either worn or handled furs that had been subjected to the process of dressing and dyeing. A recent careful search of medical literature on this subject made, confirms this statement.

The process of dressing fur is one which cleanses it to a very considerable degree, although it does not sterilize the fur which is so treated. The cheaper grades of fur, in par-

ticular, are dyed with a variety of vegetable and aniline dyes. It is well known that the aniline colors are, to a very considerable degree, zernicidal. While it is conceivable that furs might under special circumstances transmit anthrax, the likelihood of their doing so is so extremely remote as to make any fear or uneasiness on this score practically groundless. It may, therefore, be safely stated that the wearers of furs are as free from the danger of anthrax infection as any other members of the community.

DISEASE TRANSMITTED BY CIGAR CUTTERS.—Those who are familiar with habits of smokers when using cigar cutters, note that it is the practice of many persons before using a cigar cutter to moisten the tip of the cigar with the lips, before cutting it off.

It is evident that disease may possibly be transmitted in this way through the use of cigar cutters in tobacco shops. There are a number of different types of cigar cutters in use. In some only the knife blade comes in contact with the cigar. In others, the end of the cigar presses into a conical socket and the knife cuts off the projecting end. If cigars are moistened in the mouth, the type in which the cutting edge only comes in contact with the cigar, would not be apt to carry much infection, but the one with the conical socket would be very likely to transfer the saliva of persons wetting the cigar to the cigar of the next person using the cutter.

The New York Health Dept. suggests that the moistening of cigars before cutting be dispensed with as unnecessary, and that only cutters of the first type mentioned above be used. A conference will be held with proprietors of retail cigar stores, and the desirability of having sanitary cigar cutters will be presented to them.

MORTALITY FROM INFLUENZA AND PNEUMONIA IN NEW YORK.—During the week just closed, 1760 persons died in the City of New York, as compared with 1458 during the corresponding week of 1915. This increase of 302 deaths raised the death rate for the week 2.37 over that of the fourth week of 1915, the respective rates being 15.99 and 13.62. Five hundred and one deaths were reported as caused by influenza, bronchitis and pneumonia, 209 deaths more than were reported from these causes during the corresponding week of last year, but 58 less than the previous week this year. In other words the outbreak of grip and pneumonia appears to be definitely on the wane. Heart disease and nephritis showed an increase of 41 deaths. The acute infectious diseases showed a very slight increase, to wit: 7 deaths. The mortality of tuberculosis, on the other hand, was lower the past week than during the corresponding week of 1915. During the first four weeks of 1906, the death rate for the City was 16.47. The death rate for the corresponding period of 1915 was 14.89.

CENTRAL STATE HOSPITAL.—The recently published 45th annual report of the Central State Hospital, Petersburg, Va., states that there were cared for in that hospital during the year a total of 2242 patients. Of the number discharged, 143 were judged recovered and 81 improved. Of the 252 patients who died, seventy deaths were from general diseases, including pellagra, syphilis and tuberculosis. The superintendent of the hospital, William F. Drewry, in reporting the results of a visit through institutions for the insane and feeble-minded in New York and Massachusetts, states that he was especially impressed with the practicability and economic management of the colony plan of caring for the feeble-minded, and the chronic insane. "The institution and its Templeton colony, under the direction of Dr. Walter E. Fernald, is a wonder."

THE UNIVERSITY OF PENNSYLVANIA.—A new professorship of physiology, to be named after the late Dr. Isaac Ott, has recently been endowed at the University of Pennsylvania through a legacy received from his estate. Dr. Ott was a member of the American Physiological Society and a Fellow of the American Association for the Advancement of Science, and had made important contributions on the physiology and pathology of the nervous system.

APPOINTMENT OF A BELGIAN SCIENTIST.—It is announced that Dr. O. Van der Stricht, formerly professor of histology and embryology at the University of Ghent, Belgium, who had been a refugee in Holland since the outbreak of the war, has been appointed Fellow in Cytology at the Medical School of Western Reserve University, where he will devote his time to research.

NEW YEAR HONORS FOR BRITISH PHYSICIANS.—Among the British New Year honors recently announced, the order of knighthood is conferred upon three physicians, on Dr. George Andreas Berry, honorary surgeon oculist to the King in Scotland and ex-president of the Royal College of Surgeons of Edinburgh and of the Ophthalmological Society of the United Kingdom; on Dr. Thomas Wright Parkinson, physician to Prince Louis of Battenberg, to the Prime Minister, Mr. Asquith, and visiting physician to the Countess Lytton Hospital for Wounded; and on Dr. Milsom Rees, laryngologist to King George and Queen Mary and to Queen Alexandra.

EUROPEAN WAR NOTES.

BATTLEFIELD CASUALTIES.—The British War Office has recently issued a statement of the total losses of the British Army since the beginning of the war. In the January issue of the *Military Surgeon*, this statement is commented upon as follows:

"The proportion of killed to wounded works out almost exactly in the ratio of one dead for each three wounded. This was for all the forces in all zones and classes of military activity. No differentiation for the casualties in trench warfare has as yet been given out officially, but certain reports indicate that in such warfare about one person is killed to each two wounded. These figures are interesting in comparison with the proportion of 1:4 which had been accepted before the war, and indicates that the kind of warfare which is being conducted bears directly on the amount and character of transportation and hospital facilities required in the zone of such warfare. Our accepted basis for estimates on the clearance of the battlefield will, like so many other standards, doubtless have to undergo material modification."

WAR RELIEF FUNDS.—On January 29 the totals of the principal New England relief funds for the European War reached the following amounts:

Red Cross Fund	\$143,095.37
Belgian Fund	92,897.71
American Ambulance	72,636.58
Serbian Fund	71,621.87
Allied Fund	53,968.80
French Wounded Fund ..	43,234.25
Armenian Fund	29,346.83
French Orphanage Fund ..	21,333.40
Surgical Dressings Fund ..	18,492.00
La Fayette Fund	17,479.99
Polish Fund	17,051.26
Italian Fund	15,078.55

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending January 29, there were 323 deaths reported, with a rate of 22.15 per 1,000 population as compared with 226 and a rate of 15.75 for the corresponding week of last year. There were 10 deaths from influenza. Deaths from pneumonia and broncho-pneumonia numbered 65 against 32 last year.

There were 36 deaths under 1 year as compared with 33 last year, and 118 deaths over 60 years of age against 69 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 83; scarlet fever, 91, measles, 59; whooping cough, 67; typhoid fever, 4, and tuberculosis, 50.

Included in the above were the following cases of non-residents: Diphtheria, 14; scarlet fever, 20; measles, 2; whooping cough, 1; tuberculosis, 4.

Total deaths from these diseases were: Diphtheria, 6; measles, 1; scarlet fever, 1; whooping cough, 1, and pulmonary tuberculosis, 19. Included in these were the following non-residents: Diphtheria, 1, and tuberculosis, 1.

RED CROSS MEETING.—On Monday of this week, January 31, a Red Cross mass meeting was held in Boston under the presidency of Governor McCall. Mr. Ernest P. Bicknell, director general of civilian relief of the American Red Cross, made an address based on his recent survey of the belligerent countries of Europe. Dr. Richard P. Strong, Professor of Tropical Medicine in the Harvard Medical School, spoke briefly on the efficiency of the American Red Cross; and Mr. Charles J. O'Connell, special representative of the American Red Cross in Mexico, described the conditions and the need of relief in that country.

REST ROOMS FOR EMPLOYEES.—The practice of establishing in large mercantile plants a rest room with a nurse or physician in charge has long since demonstrated its usefulness. An article urging the general adoption of this plan appears in the January 17 issue of *Current Affairs*, published by the Boston Chamber of Commerce, and states among other things that the Boston Association for the Relief and Control of Tuberculosis organized some months ago a committee on health in industry, and is working to conserve the health of the employee. Its secretary has recently called on a number of firms which are large employers of labor, to lay before them the benefits derived by both employer and employee from systematic medical and hygienic supervision of the latter.

"The work of the factory nurse, or, in a very large factory, the physician, comes under several heads, including, of course, first aid in case of injuries, and the subsequent care of wounds. Relief in minor ailments, such as headaches, cramps, indigestion and toothache, enables the employee to work instead of going home for the day. Prevention of the introduction and the control of communicable diseases among workers, as infectious diseases of the eye, etc., constitutes another important branch of the factory nurse's duties."

JOHN HARVARD FELLOWSHIPS.—A meeting for the recognition of scholarly attainment in medical studies was held at the Harvard Medical School on Friday of last week, January 28. After an address by Dr. Abner Post, the John Harvard fellowships and other academic distinctions for the year were announced. Following the meeting, an informal reception was held by the Students' Association.

EXAMINATION OF FOOD HANDLERS.—The offer of the Boston Health Department to examine all persons engaged in any pursuit which includes the handling of food, and to provide them with a certificate of health, is an important experiment in public health activity. Applications for examination are entirely voluntary, both on the part of the employer and of the person employed. Up to the present time the applicants

have been mostly waiters and a few bakers, but one hotel has required all its employees engaged in any way in the handling of food to be examined. Both New York and Philadelphia have already established systems of examination, and there is a very possible source of danger of the influx of those to whom certificates have not been given, into cities where no such safeguard is in operation. In making the examination the Widal reaction is used to determine presence of typhoid. The possibility of tuberculosis is considered and sputum tests made with an examination of the family history. For venereal diseases, the throat, teeth and shins are examined. The Wassermann test is as yet optional on the part of the applicant.

DUST EXPERIMENTS.—A study of the dust conditions of the streets of Cambridge, Mass., has been made the subject of an investigation by Messrs. G. W. Whipple and Melville C. Whipple of Harvard University. Without considering in detail the effect on the health of a community, these investigators have taken measures of the dust content of the air at twenty feet above the street in different places in the city. At Brattle Street and Sparks, the lowest of the gathering places in material, the dust in the air would equal a daily deposit of nine and one-half pounds to the acre, while on Huron Avenue as much as nearly fifty pounds would be the daily deposit. These measures were taken in a windy season in spring, while summer readings showed about half as much dust, with quantities as small as two or three pounds for the minimum. The paved streets averaged a somewhat higher dust content of the air,—430 milligrams as against 402, although the bad, unpaved street rises to twenty-five per cent. higher content than the worst of the paved streets. The streets with car lines have a third more dust than streets without them, the best of them being generally worse than the worst of the free streets.

INCREASE OF HOG CHOLERA IN MASSACHUSETTS.

—At a meeting of the animal inspectors of Eastern Massachusetts held in Boston last week, Dr. E. A. Cahill of the Massachusetts Department of Animal Industry, presented a paper on the alarming increase of hog cholera in this country. For the ten years prior to 1915 this loss was \$60,000,000 annually. In Massachusetts during the past year 350 herds of swine have been inspected and 250 vaccinated. The death rate from hog cholera in untreated herds is from 85% to 100%, whereas with vaccination the death rate is reduced to 8%. It was also reported that during the three years since the closure of public watering troughs in Boston, the number of cases of glanders among horses in this city has decreased 57%. The same result has been noted in eight other cities and towns in Massachusetts where public watering troughs have been abolished.

Correspondence.

PARIS LETTER.

EUROPE AFTER THE WAR.

(From Our Special Correspondent.)

PARIS, Dec. 25, 1915.

Mr. Editor:

It has very likely occurred to my occasional readers that the letters I have been sending home during the last year have not been exactly medical! But my argument is this: During present circumstances, when all normal conditions have ceased, and the entire French medical corps is mobilized and badly overworked, such a thing as scientific life is practically altogether suspended. There is, therefore, very little strictly medical worth reporting. For months after the outbreak of war the usual medical papers, when they did appear, reached us in skeleton form; and their contents concerned nothing but army matters. Even now, although they are once more approaching their normal dimensions, their subject matter is still chiefly military, as is most natural. These articles are either surgical, or medical. As regards the surgeons, that estimable corps appears to be still irregularly proceeding in an uncertain formation of sixes and sevens! So many voices, so many opinions. Tincture of iodine seems to have been a grievous disappointment, in such mutilating warfare as this, and at the time of writing, different solutions of hypochlorite of soda hold first place in the surgical mind. Each man has his peculiar methods, his favorite antiseptic, or his serum or wash of predilection; and, in view of the well-known law, which it is almost an offence to recall,—it is likely that none of them are of very much value, otherwise their worth would be quickly apparent, in such an unlimited field as the present one. The only point that has any real importance is to get the badly wounded man under capable treatment in the very briefest space of time possible, and in this respect a marked improvement has unquestionably been effected, with the light motor-ambulance and the barrack-hospital just back of the lines. It is not evident that the eminent representatives of laboratory-surgery, mainly foreigners, who have been working in our field, have yet accomplished anything that seems likely to set fire to the traditional waters of the Thames; in fact, I do not mind stating very plainly that unquestionably the best results that I have yet seen,—at any rate in mangled limbs, joints, etc. (as he does not get cavity-lesions),—have been in the hands of what I might almost style an old-fashioned sawbones, who uses the methods of thirty years ago, sublimate, iodoform and strong carbolic! Still,—it is recognized by everyone that many roads lead to the eternal city; so that, so long as the wound is attended to promptly, opened up completely, all foreign bodies, splintered bones and badly-damaged tissues removed, and the limb immobilized in case of fracture, the maximum has been done. What little fads are indulged in subsequently make very little difference beyond supplying nutriment to each chief's special form of idiosyncrasy. In a word, then, while there is no particular progress to report on the surgical side, we can say that the last few months have shown considerable improvement in the handling of these awful wounds due to high-explosives, and that this branch of the medical service is now working in a fairly satisfactory manner.

But when we come to the medical side of the subject we find a very different state of affairs. The surprise of this war,—the most gratifying revelation,—has been the admirable record that the French people has established and that is now generally admitted by everybody. That an army that had been so severely handled in the beginning should have been able to regain its grip and do what the French army

has since done, is already a credit to the nation that will last down through the ages to come. That a people with the characteristics the French were popularly supposed to have should have shown the silent but grim determination that has been general throughout the land, has been, I think, a shock to the universe from which it has not yet begun to recover. But there has been one unquestionable blot on the picture, and a serious one,—the handling of the army medical cases. This has really been something too awful, and if the history of this side of the question ever comes to be written, it could be fitly entitled: A treatise on how *not* to take care of the medical cases of an army in time of war. The fact seems to be that the organization of that branch was hopelessly bad even in time of peace, and apparently so utterly bad that it broke down so completely that everyone connected with it is so thoroughly disheartened as to be incapable of an effort to improve it so long as the war lasts. Later on it will have to be made over from the bottom up. The surgical clan were swamped, carried off their feet, at the beginning; but they pulled themselves together and, as above remarked, are now doing fairly well. As regards the medical side, there seems to be but one opinion.

So in the way of medical or surgical novelties I have not had much to draw on; and what little there was, the sensational serums and solutions of laboratory origin, found their way so rapidly into the ordinary daily organs of public opinion, that it has not seemed worth while to repeat them. On the other hand, chance has placed me right in the midst of the greatest event of all history; why not, then, confine my efforts to what is going on about me, snapshots on general aspects of the war as seen through a medical man's eyes? O,—you can take my word for it,—these letters could be made interesting enough, if I had a free hand; I think that without boasting I can say that if I were allowed to have my own way they would be the first thing many of the readers would look for on opening the B. M. and S. JOURNAL. But such, unfortunately, is not the case. America, it is said, is a neutral country. Its love of peace likewise knows no limits, resembling in this particular the firmament, wherein you pass from star to star, each one more and more remote, without ever reaching the end of it! Nothing, we are told, can appear in a neutral paper that can hurt anybody's feelings. Consequently, in presence of these limitations, I have to do the best I can,—hence these letters.

There is no lack of pathetic scenes in the public ways of Paris just now, for anyone who chooses to look; but one of the most touching is unquestionably the soldier on his first home-leave since the beginning of the war. For some reason or other the men were absolutely separated from their families for about the first twelve months; since then they have been allowed to visit them in rotation, and this plan is to continue during the coming winter. The men, fresh from twelve-months' trench warfare, are certainly a sight! They are generally spare, all superfluous fat gone, weather-beaten, and with a serious, fixed expression of features with lines by the mouth and nose. It is not for nothing that they have stared death in the face for fifteen months, and I imagine that if the war goes on another eighteen months or two years, as seems probable, it will evolve a type of Frenchman that will be something quite unknown. The long winter coat, buttoned back at the knees, once grayish-blue, is now of an indescribable neutral tint that is probably vastly superior, from a practical point of view, to its original color. The new helmet we have not yet learned to take seriously, although its usefulness in trench warfare has now been demonstrated beyond question. To me, it gives these fine fellows a species of medieval look, and I feel sure that if you put some old pikes in their hands they would do excellently as figurants in the soldiers' chorus of Faust. Their puttees and heavy shoes show signs of very rough usage. On their wrist is the chain fasten-

ing the identification plaque. On their fingers are one or more aluminum rings made from the enemy's shells. And on their bosoms may possibly be the Croix de Guerre, or Médaille militaire. In a word, "the real thing" in the way of a *permisumvair* is so characteristic that you can spot him on sight, even if the importance and generally beneficent antics of his accompanying family do not give him dead away. I saw one of these men the other evening in the Metro, a sergeant of the 415th regiment of the line, if you please,—which will give you some idea of what the French army has now grown to,—who, with a child on each knee and a spouse opposite, was so entirely taken up with his own temporary bliss and oblivious of his surroundings that I am sure, from their looks, that every woman in the compartment was dying to hug him then and there.

But why all this talk about men on leave? Well,—because it raises one of the most important questions of this war, the future of the race. I fancy from what I hear and read that people at home neither realize the importance of this struggle, nor grasp even approximately its extent: thus, I think it not unlikely, also from first-hand evidence, that the populations of the Pacific slope, in particular, attach a good deal more importance to the San Francisco exhibition than to the war in Europe. Yet let us take a few figures. The last Prussian published lists give a total loss of 2,316,000 men for that country alone; and very naturally the published lists must be considerably behind the actual losses. This is for Prussia alone, and does not include: Saxony, 224 lists; Würtemberg, 298; Bavaria, 233; the Navy, 40.—and other smaller ones. It will, therefore, not be far out of the way to estimate German losses as in the neighborhood of 4,000,000 already.* If to this we add the other great powers, Austro-Hungary, Russia and France, and those whose losses have been smaller, Great Britain, Italy, Turkey, Belgium and Serbia, it will be evident that the general casualty list of Europe is already something absolutely fantastic. Efforts have been made to arrive at a general, approximate figure, and it is thought fairly moderate to say that there have already been *killed* in Europe about 3,000,000 men of all countries, and otherwise placed *hors-de-combat* about 9,000,000. And it should be remembered that these are in the main the pick of the nations, men in the prime of life and in the best of condition. Now, as a simple term of comparison, let me remind the reader of the war of 1870-71. We all thought at that time that that was a pretty big war, and its effect on the Europe of the past 45 years has certainly been in relation with that view of the case. Yet, do you know what the *total* German casualties were for that campaign? You will scarcely believe it: 120,000 men. Compare this with our 12,000,000 above estimated. In other words, for one man lost then on the German side, one hundred have already been lost this time for the whole of Europe.

The French publish no lists at all; but the general estimate is that their losses are as 2:5, when compared with the German; and when we consider the absolutely reckless way in which the German troops were handled in the early stages, and the constant fighting that Germany has maintained on her Eastern frontier, this estimate seems fairly probable. The general ratio of killed to casualties has been one to three, 25%. This would give the German *dead* at one million, and the French at 400,000. With another year or two of war, and the more extensive fighting that is bound to come before the end, where shall we wind up, in the way of casualties! It positively makes the mind reel. In the paper, this morning, Lord Kitchener announces four million British soldiers for next March, and six million Russians; if he is right, and these men ever get to fighting, the casualty lists will rise pretty rapidly.

So just try and imagine the state of a country like Germany at the end of this war, with, let us say, if the war goes on as expected, upwards of 2,000,000 men killed, hundreds of thousands crippled for life, other hundreds of thousands broken down for good through illness, privations and exposure, and countless ment only half-valid through minor wounds,—what a curious sort of a place it is going to be! And the same will hold good of all the other belligerent countries, though on a smaller scale, for by the very nature of things Germany's will be by far the most important losses. Then to this add the financial situation, the phenomenal taxes all these people are going to have to bear for the next few generations, since naturally this war is going to have to be paid for *some* day, however little the authorities say about that detail for the moment, and the infinity of desolation, misery and destruction in the invaded regions,—and you have a situation that is going to be simply unthinkable, appalling.

"S."

THE LAST ILLNESS OF ANNE OF AUSTRIA.

Boston, Jan. 21, 1916.

Mr. Editor:

Dr. Cabanes, in his work, "Les Morts Mystérieuses de l'Histoire," gives us some interesting side-lights on the history of the last illness of the great French Queen, Anne of Austria, who was married to Louis XIII on Oct. 25, 1615, and died of a cancer of the right breast on Jan. 20, 1666.

After some months of failing health and lassitude, Cabanes tells us, the Queen noticed a mass in the right breast, which caused her much concern. This was on the 10th of October, 1663. The superstition and empiricism of the times were such that the physicians in charge of the case allowed any one who said that they had a cure for the dreaded disease, to try their hand. The result in suffering and despair, after the poor Queen was buoyed up by false promises, can easily be imagined. The first empiricist was a priest, who assured the Queen that he had a sovereign remedy for cancer that would "harden the breast, to the point of its being like a stone." It was found that his application, an ointment, was composed of belladonna, and powdered and calcined greystone of Beauce. The application of this preparation caused the Queen to suffer extremely, and needless to say, did no good. The next experimenter, Cabanes tells us, was a certain Ailhut, a physician of Lorraine. His medicine was a purgative powder, the chief ingredient of which was scammony, and presumably he used it in the case of the Queen with no better result than the local application of the priest.

The celebrated Guy Patin followed every phase of the Queen's malady, and expressed himself warmly concerning the empirics who were allowed to treat her. Patin writes, "They talk of a great consultation at Saint-Germain, for the Queen Mother, to decide whether they should open the breast, to allow the pus to drain out, and the malignant secretions, which consume its substance from day to day.

"They speak also of a certain physician named Chatelain, that M. de Besons, the justice sent here from Frontignan; they pretend that he cures such maladies, and that he has some wonderful secret cures to use against incurable maladies. If he did not promise them something, they would not bring him from such a distance. All these are imposters. Cancer never disappears, and is never cured, but the people wish to be mistaken." (22 May, 1665.)

May 22 the Queen was seized with chills and erysipelas soon developed, which covered the entire arm and shoulder on the same side as the cancer. Patin tells us that both breasts were affected by the erysipelas, and that the Queen was so ill that extreme unction was administered. There was slight amelioration of the symptoms for a time after this (perhaps

* Barthou's recent careful estimate gives 3,700,000.

due to the erysipelas), and the Queen was taken to Val-de-Gras. The respite was but short, however, for gangrene soon appeared in the tissues of the breast. The sufferings of the Queen were so great at this time that Cabanes tells us that the court feared for her reason. The empiric in charge at this time shaved off gangrenous areas of tissue as they appeared, each operation causing the Queen added suffering. Opium was given to the patient, and Patin remarks that this was the sole cause of a slight improvement in her condition at this time. The poor Queen is said to have spoken as follows: "One does not decompose until after death, but as for me, God has condemned me to rot while I am still alive."

January 8th. Patin writes: "The Queen Mother is in a deplorable condition; she is naught but a living skeleton."

Another charlatan was as this time called in, an empiric of Milan, who had another "marvellous ointment," but this was not even sufficient in its cleansing properties to do away with the frightful odor which came from the wound. The end could not be far off, and came on the 20th of January, 1666. The Queen was a victim of the ignorance of the times, in a measure, but also of a lack of even the ordinary rough surgery of the period, which might have made her hard lot more bearable. Shortly after this time we find Jean Astruc (1654-1756), the great French syphilographer and surgeon, advocating the total removal of the breast, and the axillary lymphatic nodes, as the only possible cure for cancer of the breast. Had the Queen reigned only a short time later, and such advice as Astruc's been sought early, she might have been cured, and certainly benefited.

W. P. C.

Miscellany.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION FOR THE WEEK ENDING JAN. 22, 1916.

Dr. A. C. Kimberlin, Indianapolis, Ind. \$5.00
Previously reported receipts.....\$7936.86

Total Receipts\$7941.86
Total disbursements.....\$7310.04

Balance\$631.82

F. F. SIMPSON, M.D., *Treasurer*,
7045 Jenkins Arcade Bldg.,
Pittsburg, Pa.

APPOINTMENTS.

Dr. John S. Billings, Jr., has been appointed deputy health commissioner of New York.

The following appointments are announced at Western Reserve Medical School:

Dr. J. Rogoff, formerly of the department of physiology and pharmacology, Vanderbilt Medical School, Nashville, to be instructor in experimental medicine; Dr. C. H. Fiske, formerly assistant in biological chemistry, Harvard Medical School, to be associate in biochemistry; Dr. R. W. Scott, formerly demonstrator of medicine, Western Reserve University, to be instructor in physiology.

BOSTON DISPENSARY.—The Boston Dispensary has recently appointed Dr. William A. Hinton as pathologist, to take charge of its laboratory work, which has developed greatly during the last two years under the direction of Dr. Sarah E. Coppinger.

SOCIETY NOTICES.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—Stated meeting at United States Hotel, Boston, Thursday, Feb. 3, 1916, at 11.30 A.M. Reader, Dr. John D. Adams, of Boston, for Dr. John H. Ash, of Quincy. Subject: "Diagnosis and Treatment of Spinal Affections."

F. H. MERRIAM, M.D., *Secretary*,
South Braintree, Mass.

THE HARVEY SOCIETY.—The sixth lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third street, on Saturday evening, February 5, 1916, at 8.30 P.M., by Dr. Hideyo Noguchi of the Rockefeller Institute for Medical Research. Subject: "Spirochaetes."

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY.—The next meeting of the New England Ophthalmological Society will be held at the Massachusetts Charitable Eye and Ear Infirmary, 233 Charles street, Boston, on Tuesday, February 8, 1916, at 8 o'clock

Program:

Hospital Cases

Papers

Retro-Bulbar Neuritis, with report of three cases.

Dr. Leon E. White.

Symposium on Refraction (Continued). Paper by Dr. Lancaster will open the discussion.

W. HOLBROOK LOWELL, M.D. *Secretary*.

MASSACHUSETTS GENERAL HOSPITAL.—A meeting of the Massachusetts General Hospital Clinical Society will be held Monday, February 7, at 7.15 P.M., in the Out-Patient Building Amphitheatre. Subject: Syphilis.

1. Cases of Congenital Syphilis, Dr. Durkin.

2. Pathological Lesions in Syphilis, with Special Reference to the Endothelial Leukocyte (Lantern slides), Dr. Beard.

3. Treatment of General Syphilis, Dr. Dwinell.

4. Treatment of Central Nervous System Syphilis, Dr. Kerr.

The visiting and administrative staffs, physicians, surgeons and students are cordially invited.

ELLIOTT C. CUTLER, M.D., *Secretary*.

RECENT DEATHS.

DR. CHARLES CLIFFORD BARROWS of Ithaca, N. Y., who died on January 3, was born in 1857. He was professor of gynecology at the Cornell University Medical School.

DR. W. A. BORGER, assistant director of the Pasteur Institute in Java, has died there from laboratory infection with bubonic plague. He was born in 1876.

DR. WALTER L. CAPSHAW, who died of pneumonia on December 25, 1915, at Norman, Okla., had been for seven years professor of anatomy at the University of Oklahoma. He was a graduate of the University of St. Louis.

DR. ALFRED IRA NOBLE, superintendent of the Kalamazoo State Hospital (Michigan Asylum for the Insane), died suddenly at Detroit, January 20, aged 58 years. He was born at Waterville, Me., and was a graduate of the Medical School of Maine (Bowdoin) in 1886. Until ten years ago he was at the State Hospital in Worcester, Mass. He had been a Fellow of The Massachusetts Medical Society since 1887, continuing his membership while in Michigan. A widow survives him.

DR. JOSHUA SWETT, 60, one of the leading physicians of Litchfield County, Connecticut, and for many years coroner's medical examiner for the towns of New Hartford and Barkhamsted, Conn., died of pneumonia at his home in New Hartford, January 20, after a week's illness. He was president of the New Hartford Electric Light Company. He leaves a widow and three sons. Dr. Swett was born in Bethel, Vt.

The Boston Medical and Surgical Journal

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Address.

SIR JAMES PAGET AND PAGET'S DISEASE.*

By ELLIOTT C. CUTLER, M.D., BOSTON.

I. PAGET'S DISEASE.

My claim to talk on Paget's disease of bone, does not rest with any exceptional interest I may have, as a medical man, in this affection, for it does not seem to be within the realms of possibility that the successful treatment of this disease shall come through surgical efforts. But, as to all students of medicine imbued with sufficient curiosity and the values of a historical background, diseases appeal which are named after their discoverers, so in this instance, because of the name, I was led to a study of the man and his times. The effort was a thousand times repaid, for James Paget is one of the great men in modern medicine. I say modern, for he lived through the years when anesthesia was discovered and had as contemporaries Pasteur and Lister.

And to talk on Paget I have full right, because he was, first, a great surgeon, though much of his greatness was obtained because of his scientific efforts, his teaching, and his literary gifts. I found his life tremendously stimulating and interesting, and indeed it constitutes an ideal whose study will be of vast benefit to all medical

students and a fine example to any who care to model their lives thereafter.

To clear up what may confuse some of you, I will merely recall that there are two diseases called Paget's disease. In 1874 Paget read a short report on "Disease of the Mammary Areola Preceding Cancer of the Mammary Gland." At the present time, cancer of the breast, beginning about the areola, usually as an intensely red, raw, finely granular skin lesion, is known as Paget's disease.

In Paget's disease of bone, called by him osteitis deformans, we are more interested, and it is in relation to this disease that Paget's name is most often recalled. His original communication I have here; it came out in 1876, when he was sixty-two years old, and is entitled "A Form of Chronic Inflammation of the Bones." Now this disease forms a definite clinical picture in its outward aspects and it occurs to me that, like Addison's disease, Parkinson's disease and Hodgkin's disease, it was the external manifestations of the disorder that attracted Paget's curiosity and observation and made him study further a group of cases so evidently unusual. Even now there must be many unrecognized disease entities amongst us which we may even see frequently, but doubtless their outward manifestations are obscure and vary so greatly that even our best observers fail to detect them.

Paget himself called this bony disorder a rare disease of bone and it still remains such, though some 200 cases have been reported in the literature. Since Paget pointed out the characteristics which we shall discuss, studies of the past literature and old museum specimens have re-

* Read at the meeting of the historical section of the Harvard Medical Society on Jan. 4, 1916.

vealed many unrecognized cases. Jonathan Hutchinson himself claimed to have found a typical example in a mummy's skull from Egypt. Yet, that it is still a rare disease is shown by the fact that of 285,000 out-patient cases at the Massachusetts General Hospital, in the years 1903 to 1915, only 7 cases are recorded as definite examples of this disorder.

Now, as I have suggested, the clinical picture is pretty definite except in the cases where a single bone is affected. These cases are extremely rare and the diagnosis rests entirely with the x-ray findings. It is essentially a chronic disease of bone occurring in middle or late life and usually unattended by any symptom other than those of skeletal changes, except for grumbling rheumatic pains in the parts affected. Paget himself paints the picture clearly as follows: "The disease begins in middle age or later, is very slow in progress, may continue for many years without influence on the general health, and may give no other trouble than those which are due to the changes of shape, size and direction of the diseased bones. Even when the skull is hugely thickened, and all its bones exceedingly altered in structure, the mind remains unaffected. The disease affects most frequently the long bones of the lower extremities and the skull, and is usually symmetrical. The bones enlarge and soften, and those bearing weight yield and become unnaturally curved and misshapen. The spine, whether by yielding to the weight of the overgrown skull, or by change in its own structures, may sink and seem to shorten with greatly increased dorsal and lumbar curves; the pelvis may become wide; the neck of the femora may become nearly horizontal, but the limbs, however misshapen, remain strong and fit to support the trunk."

Further, in describing his first case, he emphasizes strongly the postural defects. "The shape and habitual posture of the patient were thus made strange and peculiar. His head was advanced and lowered so that the neck was very short, and the chin, when he held his head at ease, was more than an inch lower than the top of the sternum. The short, narrow chest suddenly widened into a much shorter and broader abdomen, and the pelvis was wide and low. The arms appeared unnaturally long, and though the shoulders were very high, the hands hung down by the thighs and in front of them. Altogether, the attitude in standing looked strangely in contrast with the large head and handsome features."

The pathology is characteristic and borne out by the x-ray findings. It consists in a destruction and absorption of the bony tissue in the part affected; phagocytes and giant cells attack the bone, which disappears with confluence of the Haversian systems and trabeculation of cortical substance; but at the same time proliferation goes on, new bone is laid down in the mar-

row cavity, in the new spaces left by the destruction of the old cortex and also on the surface of the bones. The new bone at first is lacking in bone salts, and Paget himself found that phosphorus, calcium and magnesium were less than normal in affected areas. Thus the structure, though thickened up and larger, is less strong and gives way before the weight of the body, producing in the spine and lower extremities the characteristic deformities.

(Lantern slides were then shown, illustrating by photographs of patients and x-rays of separate bones from different localities, all the typical characteristics of the disease. In addition the plates from Paget's original case were reproduced and finally two portraits of Paget and an engraving of St. Bartholomew's Hospital, made in 1844, were shown.)

II. SIR JAMES PAGET.

James Paget was born in Yarmouth, England, in 1814 and died in London in 1899. These 85 years were filled to overflowing always with incessant activities, and indeed, it seems remarkable, to me, that a man could work so continuously and so hard and yet survive to such a ripe old age. It is interesting for those of you who are connected with the medicine of Boston to recall that it was in 1810 that Warren and Jackson started the foundation of the Massachusetts General Hospital, which received its first patient in 1821.

Stephen Paget, the father, was a brewer and ship owner, prosperous, temperate, refined, public-spirited and generous. The mother was a splendid woman of better social position. Paget speaks of her father as a real gentleman who left as a legacy only the gout, of which he himself inherited a most troublesome share. She was a handsome, strong-willed woman, best remembered for her intense love of her children, but also for her great industry and skill in writing, needlework, and painting. Such then were his parents and Paget boasts he was well born!

It was a large family, 17 children in all, nine growing to full age, of whom James was the seventh. All were well gifted, two being artists of considerable skill, and one an entomologist of note.

Paget speaks of his schooling as being fair. It took place in a small boys' school in Yarmouth, where he states they progressed in mathematics to the quadratic equation and to unknown depths in Homer and Zenophon after Caesar, Sallust and Euclid! Anyway he made the best of his opportunities and early distinguished himself by being head-boy in the school for his last two years there.

At 16 he was through this school and it was determined he should be allowed to enter the navy. Indeed, his father had already written a letter to a friend, asking for a commission, when thinking better of it, he kept the letter over night and destroyed it the next morning. There

was much turmoil and inward struggle for young Paget, but what a lucky bit of suffering it was!

Apprenticeship. 1830-1834.

So it was determined he should become a surgeon, and at 16 he was apprenticed to Mr. Charles Costerton, the active and energetic local practitioner. Here he was to assist for four and a half years and then be allowed to go to London to study. Paget at once set himself to work with great enthusiasm and energy. He kept the office, the accounts, learned to put up medicines, the dispensing of drugs and care in minor surgery. He writes of the time spent in this work as too long, but his interest was unflagging. He saw much work of our out-patient class type and speaks of varicose ulcers as being useful for bandaging, and the experiences in injuries, minor sicknesses, etc., quite valuable. He studied hard at books, taught himself French and learned considerable anatomy.

During all these years he was a keen student of botany, in which he early displayed great interest. He was always walking about collecting and observing, and indeed an old lady of Yarmouth wrote, "that young Paget walks about the country too much to be a student of medicine." His thirst for knowledge in the things he was interested in was unquenchable, and he speaks of digesting fully a book on botany of 26 volumes, which he found in his father's library. The result of this botanizing was the joint publication with his brother Charles of a book entitled, "The Natural History of Yarmouth." This came out in 1834 when he was only 20 years of age and remains even today, because of its thoroughness and accuracy, a distinct authority on the local flora. It won him the recognition of Sir William Hooker, then the greatest botanist in England and a celebrated scientist. In looking backward from the prospective of his whole life, the value of this training in botany cannot be overestimated. In the first place it was self taught and next it made him an accurate observer. It gave him a scientifically inquisitive mind, taught him the value of going to books for reference and knowledge and by the success of the published effort brought him into contact and friendship with really scientific men and gave him a taste for the exposition of his work.

Hospital Pupilage. 1834-1836.

In 1834, when 20 years old, he went to London and entered the medical school of St. Bartholomew's Hospital. This had been for many years the greatest of the London Schools and through its great surgeons of the past, Abernethy, Percival Pott and others had become especially noted in its surgery. At the time Paget entered, the interest in the school and in teaching had somewhat fallen away and disorder was beginning to prevail in the staff and school. But Lawrence, then the surgeon to the hospital, was

at the height of his fame and his talks were the great mainstay in the school. He was an impressive speaker, knew his subject well and got perfect attention. From Stanley, the anatomist, Paget got much, and in after life he speaks of learning from him the value of dull, careful painstaking work. Paget himself became a beautiful dissector and was always at work on this subject. The museum of the hospital was well rounded and equipped and a constant source of enjoyment to the boy. He read a great deal; indeed he never seemed to sleep, and during the evenings of his first year taught himself German. This gave him much repute, for but one other student knew this language and but few of the staff. The result was that older men, clinicians, and even his teachers brought him foreign publications for translation and thus he came into contact with many more medical people with whom acquaintanceship was valuable. It was during this year that he made the discovery of the parasite "*Trichinella spiralis*." For years in the dissecting rooms the small white flecks had been noted in the muscles of subjects, but Paget's curiosity and thirst for exact truth led him on, even to borrowing the use of a microscope, then indeed a rarity. It was then that he observed the parasite, encysted in its capsule, made drawings and called the attention of others to his finding. One of his instructors, Owens, borrowed the drawings and reported the discovery, giving Paget full credit. At the end of this first year he graduated first in all four subjects and thus through his industry, ability and success was already a marked student.

Of the vacation at the end of his first term he writes, "I do not remember the occupation of the vacation time," but doubtless it was well taken up with work of some kind, for he never rested or let his interest slacken. During the second year he was more in the hospital and about the wards, seeing and studying actual cases, much as our clinical clerks do now-a-days. At the same time his interest in the Post-mortem room continued and he was busy at all odd moments with dissections. His knowledge of anatomy was excessive already. At the end of this term he was again first in all subjects studied and his success with his classmates was very popular, for his abilities and industry were well known and recognized. He himself writes that in those years he must have had a "great facility for cramming," for in his examination in medical jurisprudence, he afterwards found he had quoted almost verbally whole paragraphs from a book on this subject he had read just previous to the examination. During this year he passed for the College of Surgeons, and his accurate and comprehensive knowledge of anatomy is shown by the fact that when in this examination he was asked to tell about the fifth nerve, he gave a full description of the otic ganglion, a then little known subject.

Waiting Time. 1836-1843.

And now at 22 he was ready to practice surgery. The question at once arose of where to go. Two choices were open, local country practice or to stay on in London and to hope, with time, for a position on the hospital staff. Of course he chose the latter, despite the difficulties, and there were many obstacles, primary of which was his absolute lack of funds. His father was to send him ten pounds a month when possible, but as the latter had already entered on the years when his business steadily failed, this was a most precarious source of support. However, the die was cast and Paget had hopes that, by tutoring, journal work and a rare case he could eke along. Curiously enough, he very soon became engaged to be married, of which he writes, "it is not to be pretended that wisdom, discretion, forethought or any method of sound judgment had anything to do with it," adding, however, later, "this indiscretion was the happiest event of my life." Certainly his marriage, fulfilled eight years later, was a very happy one.

Following his graduation from the school, seven hard years passed by before any promotion came, years of unremitting, colorless work. But with all the drudgery and hours of disappointment, there were bright moments, and the vast amount of knowledge acquired and work done was unquestionably the basis for his future great success. These seven years are best called his "waiting time" and they are necessary years for all who would rise to such heights. Of these years, Paget writes very haphazardly. He was waiting for a hospital appointment. He tried his hand at everything; teaching, museum work, had a very rare case, but mostly it was reading and abstracting and translating for journals. There was one trip to Paris from which he returned a bit broadened and with a wider range for thought and study, but he was not much stimulated. He learned Italian and Dutch so as to get more work and better positions on the various journal staffs for which he labored. He wrote for the *Penny Cyclopædia* and the *Biographical Dictionary*. And he kept very long and late hours.

After a few years he became curator of the museum, where his time was taken up with arranging and sorting specimens, drawings, dissections, etc. It was a good apprenticeship for the position of Demonstrator of Anatomy, which came later, and also, it led to his writing the "Pathological Catalogue of the College of Surgeons Museum."

This all kept him from practice but he "had to live."

In 1839, he had typhus. Later in the same year he was made Demonstrator of Pathological Anatomy and in 1841, Demonstrator of Anatomy. He was very popular with the students and his vast amount of reading kept him so well informed of the most modern ideas in medicine that he talked easily on all subjects. He wrote

a general anatomy which was refused. It was a bitter disappointment but he consoled himself with the thought that he had learned much in preparing it. From now on papers followed in rapid succession. In reviewing a summary of his publications, I counted 147 publications of books, addresses and reports and there were many others. In 1842, came a paper on "The Chief Results Obtained by the Use of the Microscope in Anatomy and Physiology." And always he was a great pleader for the microscope. It was one of the most valuable inheritances from his botanical education.

These seven years of waiting were ones of the most confined, unremitting labors. He kept terribly late hours, was a tremendous reader, an enthusiastic student and became an admirable teacher. Of patients he had very few, his receipts for these seven years from patients being 94 pounds, something less than \$500. Think what dull years on the surface they appear to be, and yet they were unquestionably the most fruitful of all, for in these years he trained himself. He became the most widely read medical man of his time and his knowledge of French, German, Italian and Dutch put him in touch with all the scientific work going on. He, therefore, was more up to date than any of his contemporaries and admirably suited for whatever the future might bring.

I think these years, coupled with his wonderful start and his interest and training in botany, gave him the basis for all that came after; for in botany he learned the value of careful and correct observation, and in school, the advantages of dull, laborious study. In the seven years of waiting he added a fund of knowledge that made him the most resourceful and scientific medical man in England for the next thirty years.

Promotion. 1843-1851.

Finally in 1843, when he was 29 years old he was elected to fill the new chair in physiology and was made Lecturer in Physiology. For this position he was admirably suited and there was no contender for the position. His lectures were a great success. He had read everything and had tested out most that he had read. He spoke well, his lectures were well attended and perfectly listened to. The best of his pupils was Kirkes, a clear headed industrious boy, who shortly afterwards published a "Text Book on Physiology" which consisted practically of his notes of Paget's lectures. And indeed Paget became a really gifted speaker and gained much notoriety this way.

Soon after he was given this appointment, St. Bartholomew's established the collegiate system, chiefly through Paget's efforts. Quarters were taken in which many of the hospital pupils came to live and Paget was made regent of the college. This rapidly proved most successful, for boys studied medicine very young in those days and thoughtful parents at once saw the advantage of having their sons live in a college under

the guidance of some older and more thoughtful spirit. The fact that almost all the prizes in the school were taken by those boys residing in the dormitory or college building shows that the better class went thither and also that Paget's influence was indeed a stimulating one. He married shortly after this and for eight years lived in the college dormitory. His life now became much fuller and more happy but there was no remission or let down in his work. The cares of the college, the school and his lectures took all his time. He gave up his journal work.

Soon promotion and new offices came. First the assistant surgery to the hospital and then Professor of Surgery and Anatomy to the College of Surgeons. He now completed his catalogue of the hospital museum and also the pathological catalogue of the College of Surgeons, at which latter work he writes he was at work "every day for seven years." In 1843, he was one of the original 300 Fellows of the College of Surgeons. His lectures there, as Professor of Anatomy and Surgery, formed the basis of his book, "Lectures on Pathology," published in 1853. In 1861, he became a Fellow of the Royal Society. Again, in a lecture on "Recent Progress in Anatomy," he emphasizes the great strides due to the use of the microscope,—"The microscope must be used before we can approach the knowledge of one of those truths for want of which we are still constantly practicing in doubt."

In 1851, he resigned the wardenship of the college, moved into a new home and began to practice medicine. During this second period of seven years, his so-called academic years, Paget had worked almost without intermission, usually till 1 A.M. Lectures, school administration, publications and writings left no time for anything else. It is remarkable that he could have kept up the pace.

Private Practice. 1851.

Paget was now 37 and his life as a great and very successful surgeon began. For those of you who are already, as students or internes, desirous of getting into private practice and chafing at the passing years, there is much philosophy in these fourteen years of Sir James Paget. And none of you can afford to miss the opportunities to study them well.

If up to now his work had been hard and laborious, it may be said there was no diminution in the hours at work in the years to come. He was always working at top-speed. Besides a tremendously active practice there were lectures, offices in multitudes of societies, public positions, publications and duties end on end. His success in practice is well shown by his income. This rose rapidly to 700 pounds a year, then gradually to exceed 10,000 pounds, (over \$50,000), till at 64, he gave up his hospital appointment and active operating, from which time it decreased. He had the very best practice in London and his attendance on the Royal Family as

Lieut.-Surgeon to Her Majesty and the Princess of Wales brought him a great reputation as well as a baronetcy. He acquired an immense consulting practice, which he speaks of as the most interesting because it brings "the largest number of interesting cases, the least work, the greatest responsibility, the most agreeable associations and the best position and relation with one's brethren in the profession." He was very popular with both the profession and patients, but always considered the former as by far the more valuable and important.

In time he succeeded to the Surgeoncy and the position of Lecturer on Surgery in the Hospital. He was constantly overworked and run down, averaging 16 hours at work a day, year in and year out. As a result there was some sickness, including six attacks of pneumonia between 1851 and 1870, of which, he writes, "had they been cared for would have made hard work almost impossible." To me, as I have said before, one of the most extraordinary things is that Paget did live to be 85. In 1871, when 67 years old, he poisoned himself during a post-mortem examination. After an illness of three months, which doubtless was greatly prolonged because of this past overwork, he resigned his hospital appointments to his great regret. He says of himself, "I was very heavily overworked, was 67, liable to trouble in my lungs, and not unlikely to break down in such rush and haste as I sometimes lived in." He continued in private practice for some years still and worked even harder than ever, fearing lest people should think him about to retire.

Now throughout all these years ran his constant gifts to medical knowledge. He was a most prolific contributor, and the numbers of lectures he gave and meetings of societies he attended is extraordinary. He belonged to most of the medical and scientific societies of Great Britain, the Continent, and America. (Among them the Massachusetts Medical Society). He was on all sorts of boards and committees and held many active and honorary offices. There were few vacations and he cared little for sports or animals.

He had numerous friends, many of them of wide repute. Gladstone, Newman, Ruskin, Tennyson, Lowell, Tynsdale, Oliver Wendell Holmes, Huxley, Pasteur and Darwin were among his intimate acquaintances, and what a group it was!

In 1895, Lady Paget died, and from this time he seemed to fail. But he fought his old age with good spirits, and up to his last year, when the Bible was his constant source of reading, he kept at his medical readings, studies and the analysis of his past work and cases. Finally, while at a children's party at his son's home Christmas Day, 1899, he caught cold and within a week succumbed to broncho-pneumonia.

It had been a remarkable life, very full, very active and satisfactory and led him in his old

age to a position from which he could with real satisfaction look back on the fruits of his labors. A close study of it reveals much of interest to all, but particularly to those of the profession interested in something above ordinary success. It is a revelation of the advantages of connecting scientific learning with the practice of medicine, and a model of many of man's best qualities, and highest ideals.

Original Articles.

A SKETCH OF THE ORGANIZATION FOR THE CARE AND TRANSPORTATION OF THE SICK AND WOUNDED IN THE BRITISH EXPEDITIONARY FORCES IN FRANCE.

BY ROGER I. LEE, M.D., BOSTON.

THE following little sketch must in no sense be regarded as authoritative. It includes only what came under my own eyes in a recent trip to France as a member of the Harvard Unit. This unit took complete medical and surgical charge of a British Base Hospital and was a part of the organized Medical Department of the British Government. For a little over six weeks I participated in the activities of the unit in a so-called British Base Hospital, No. 22 General Hospital at Camiers, Northern France, and was able to see the intimate details of the workings of a base hospital. At the end of my stay there I was fortunate enough to be permitted to visit a number of the casualty clearing stations, field ambulances and advance dressing stations near and at the front.

For descriptive purposes it is easier to follow the course of patients from the firing line to the rear. At the front itself one finds the so-called advanced dressing stations. The nature of these depends entirely on the configuration of the ground and the personal ideas of the medical and military officers of the regiment. The advanced dressing station that I saw reminded one of a rabbit's hole in the side of a hill. It was a dark dug-out made of the roughest possible material, an oblong space with room for 12 stretchers on the floor. A rough wooden table and a very few simple instruments completed the equipment. The personnel consisted of two doctors and two orderlies. Wounded cases were usually seen on the field and merely brought there as a place to rest before they were transported. One was told that little or no surgery was attempted here. One must remember that outside of a big action the usual activity of an advanced dressing station is very like the accident ward in a large hospital. Soldiers come with fever, scabies, middle ears, skin trouble, sprained ankles as well as the wounds incident to desultory artillery fire.

Every disabled soldier is sent to the dressing station, and if his condition is at all serious is kept under observation over night. Here begins the preliminary sorting of cases. A fair number of minor ailments may return to the trenches. All the others are promptly transported, evacuated it is called, in ambulances which are summoned by telephone. We saw in the trenches themselves a stellate arrangement of trenches and dug-outs which was designed as a sort of hospital bay in the actual trenches. We were told that this had never been used and probably never would be used, because in any severe action sufficient to justify the use of this hospital bay, the chance of a shell exploding in the ramifications of this arrangement and killing everybody in it was too great. In times of severe action patients are merely laid on stretchers and placed in a protected spot to await their removal. From the advanced dressing stations patients are removed either to a field ambulance or to the casualty clearing stations, nearly always the latter.

A field ambulance is usually situated about five miles back of the front line and may be well compared in appearance to a gypsy encampment. The several that we saw were all the same. They were located usually on the border of a little wood. Only the actually necessary tents were in place. The three or four tents for the officers were up, and perhaps a large tent or two for patients. In case of pressure a considerable number of tents could be erected at short notice. Since five miles is within easy shelling distance, every attempt was made not to suggest to scouting aeroplanes the presence of a military encampment. The field ambulances draw their patients mainly from the reserves who are billeted in the nearby houses and villages. Patients who were not seriously sick or wounded may be sent here for further observation or treatment from the advanced dressing stations. Only a relatively small proportion of an army is actually in the trenches at any one time. The artillerymen, the reserves, the men resting after their stay in the trenches and the large number of men furnishing supplies, ammunition, etc., form a large majority. The field ambulance cares for this group. In the field ambulances there was no set operating room, but in case of emergency operations could be done. Cases remaining over two or three days were evacuated to one of the casualty clearing stations by ambulance.

The casualty clearing station is the most interesting unit of this whole organization. That is situated usually ten or fifteen miles back of the front lines and consequently out of the usual range of shells. In the casualty clearing stations one finds nurses. This is the nearest to the front they are allowed to go. We saw two fairly typical casualty clearing stations. One was in an old military prison and the other was in tents in the open. A casualty clearing station usually accommodates 600 to 800. The reason for this number is that it is the usual complement of a

hospital train. It is here that the actual emergency surgery is performed, whether it is an amputation or appendectomy. Here, if possible, the cases are cleaned up and bathed. There are no beds and no sheets. The British Army Medical Corps stretcher is so designed that it makes a very comfortable bed. When it is necessary to do dressings, etc., the stretchers are lifted on wooden horses or trestles in order to get a suitable height. Since the stretcher is easily portable and always uniform it often happens that a man is put on a stretcher at the front, and he may actually arrive in England on that same stretcher although having been transported in several ambulances and trains. At the casualty clearing stations there is no x-ray plant and no laboratory. When any laboratory work is desired, the mobile laboratory is telephoned for and comes forthwith. The mobile laboratory is well-equipped and undertakes all the necessary routine examinations, even at times to the establishing of such a diagnosis as bacillary dysentery. A large majority of the cases in the casualty clearing station, however, are moved back within 24 hours. The venereal cases are sent to a special hospital. The obviously permanently disabled cases are sent directly to England. The others are sent to one of the numerous base hospitals in northern France. A few cases are kept for observation. Some have trifling wounds or illnesses and are kept for recovery, but these are not many. Others are kept because they are actually too sick to be moved. From the casualty clearing stations cases are transferred by ambulance to the hospital trains at the rail head.

The usual hospital train accommodates from 600 to 800. On the hospital train the important differentiation is between sitting and lying patients. The sitting cases are placed in the ordinary compartment of a corridor train, the lying cases are placed on stretchers in tiers either in specially constructed cars or in slightly modified baggage cars. Each train is in charge of a medical officer and a nursing sister. The trains move along slowly to some railroad stations near a group of base hospitals. In our particular base hospital convoys usually came at night, 2 a.m. being the favorite hour. Word would arrive by telephone two or three hours earlier that so many sitting and so many lying or stretcher cases were to be expected. This was our share of the train load. Such a convoy varied from 60 to 200 patients. As a rule, there would be two or three sitting cases to every stretcher case. At the railroad station the sitting cases would be loaded into charabancs and the stretcher cases into ambulances. They would come into a reception tent and there be distributed to a medical or surgical ward as the case might be. By this time every patient knew his diagnosis. It was unusual to find a Tommy who could not glibly repeat the technical medical term for his injury or disease. Arthritis, popliteal space, neurasthenia, V.D.H. (abbreviation for valvular disease of the heart) rolled off their tongues very

smoothly. After they got to the wards another bath, some hot broth, and then the usual program was sleep for 24 to 48 hours.

Practically all the British base hospitals have accommodation for 1040. Before this war the usual unit was half that, 520,—500 beds for the soldiers and 20 for the officers. As a matter of fact few base hospitals in this war received officers. Special accommodations were made in a few hospitals and some smaller hospitals were entirely given over to officers. A base hospital might be located in a large hotel or warehouse. The majority of them consisted of tents. There were a few in wooden huts. Ours was a tent hospital. Three marquees jointed together made a ward for 39 patients. There were three lines of wards, A, B and C. The wards were numbered in the line. Usually there were 29 wards. In the centre of B line was the hospital kitchen in a wooden or asbestos board hut. The operating rooms were in a hut, which also had a room for x-ray and the laboratory. The base hospital is under the charge of a commanding officer, who attends to all the administrative work. The hospital is divided into two divisions, medical and surgical. Each division has its commanding officer. The other officers are assigned to one of these divisions. Roughly, one-half of the hospital is surgical, the other half medical. This arrangement is elastic and easily changed. In quiet times nearly half of the cases may be medical, but with active fighting a large proportion of the cases are, of course, surgical.

Base hospitals are essentially three weeks' hospitals, that is to say, few patients are kept longer than three weeks. On recovery, which is the rule, patients are sent to convalescent camps, where they may stay for another three weeks, and which are only barracks in charge of a medical officer, or to base details. Base details simply means that a man is fit to do some work. For example, men too old for the trenches are sent to base details, where they can get light jobs of the thousand and one varieties that must be filled in the rear of a large army. The fit men usually join their regiments from base details. If, at the end of three weeks in a base hospital, the patient still required considerable medical attention, the problem is faced as to whether he will recover in another three weeks. Only the obviously maimed and the organically diseased were allowed to return to England. For example, pneumonias convalesce in France, not in England. Wounds causing slight deformity but no serious interference with function do not return to England. A case returns to England only after most strict and severe scrutiny. The few cases that return are collected in ambulances, as either stretcher or sitting cases, and are taken aboard the hospital ship at Boulogne or Calais, taken across the channel and put on a hospital train on the other side and redistributed there. Certain cases go directly to England from the casualty clearing stations by hospital train and a few other cases go from the casualty

clearing stations by means of hospital barges along the system of canals to Calais. The medical authorities try to reserve the hospital barges for non-operative cases, such as bad fractures of the humerus and certain severe head injuries. The barge hospitals struck us as the most comfortable method of transportation. A barge accommodates some 20 odd patients, in charge of a medical officer and a nursing sister. A canal tug would take seven such barges. It required two days to go from the front to Calais. We were told that it was a most uneconomical form of transportation, in time and medical officers, but it was easily the most comfortable method of traveling. In England cases are distributed in a much more specialized way. Nervous and mental cases go to one particular hospital; some hospitals take only surgical cases of one sort and another.

This sketch represents the usual system. In the event of a big action, the method is usually modified by all sorts of special circumstances. If the action can be anticipated, every nearby hospital is emptied preparatory to the reception of new cases. The base hospitals, which in times of quiet only reluctantly send cases to England, send all their patients to England. During and immediately after a big action, the base hospitals, 35 to 50 miles in the rear, merely act as casualty clearing stations and may keep their cases only a few hours. A soldier has been in bed in a London Hospital within a few hours of being wounded in France.

One always gets general impressions which are often hard to prove statistically. The first impression was that the particular system now used by the British Expeditionary Forces in France for the care and transportation of the wounded was merely the development of the experience of the British Royal Army Medical Corps in handling sick and wounded for many years. In every unit one saw at least one, usually several officers or non-commissioned officers with service ribbons. The evidence of previous experience could be seen in many small ways. Another very distinct impression was that the whole system was splendidly organized. While there were delays and bothersome petty difficulties, yet all the essentials were always present. Nothing was left to chance, but everything seemed carefully planned. The strongest impressions, probably the result of the two previous impressions, was that the British soldier when sick or wounded received admirable and abundant medical and surgical care, and everything possible was done for his comfort in transportation.

THE OCCURRENCE OF THE WASSERMANN REACTION AMONG HOSPITAL PATIENTS.

WASSERMANN REACTION AS A ROUTINE TEST AMONG PATIENTS ADMITTED TO THE FOURTH MEDICAL SERVICE OF THE BOSTON CITY HOSPITAL.*

BY ALBERT A. HOENOR, M.D., BOSTON.

CASES admitted to this service are unselected medical cases, and are practically one-fourth of the cases admitted to the medical wards of the Boston City Hospital. Originally, it was suggested by Dr. Sears that we do a Wassermann test upon all cases admitted to his service. This was at all times our intention, but at times more urgent work interfered so that many of the cases, particularly those remaining in the Hospital only a few days, failed to have blood taken for the test. The analysis herewith presented is of the first five hundred of these cases having a Wassermann test, irrespective of the diagnosis. Eighty-seven of the five hundred, that is to say, more than one of every six, had a positive test, either with the old Wassermann reaction or the test modified by the use of cholesterinized antigen. In only eighteen of these cases was a probable diagnosis of syphilis made before the Wassermann report was received. This means that sixty-nine out of five hundred, or 13.8%, of the cases not showing obvious signs of syphilis showed a positive test. Many of these cases after the Wassermann reaction had been reported positive, upon a more thorough physical and x-ray examination, were found to have signs consistent with syphilis. The following is a table showing the diagnoses made irrespective of the syphilitic condition.

	Positive.	Negative.	Total.
All cases	87	413	500
Pneumonia	10	49	59
Emphysema	2	6	8
Pulmonary tuberculosis	4	36	40
Hemoptysis	1	0	1
Cardiac			
Auricular fibrillation	2	0	2
Aortic disease	1	5	6
Aortic and mitral disease	1	5	6
Mitral disease	5	51	56
Cardiorenal	5	5	10
Renal	4	21	25
Diabetes Mellitus	2	6	8
Erysipelas	7	13	20
Rheumatic fever	2	16	18
Other Arthritis	2	9	11
Typhoid	5	14	19
Influenza	1	4	5
Scarlet fever	1	2	3
Malaria	1	3	4
Sinusitis	1	1	2
Stomatitis	1	1	2
Brain tumor	1	2	3
Cirrhosis of liver	2	6	8
Anemia, primary	1	1	2
Cardiospasm	1	0	1
Peptic ulcer	1	2	3
Cancer (stomach)	1	16	17

* Read before the Suffolk District Medical Society, November 17, 1915.

	Positive.	Negative.	Total.
Alcoholism	1	30	31
Heat exhaustion	1	1	2
Syphilis	18	2	20
Acute poisoning	1	12	13
Morphinism	1	0	1
Miscellaneous	0	94	94

In none of these diseases is there a sufficient frequency of positive tests to make one think that the positive test was due to the non-specific condition. It is of interest to note that in malaria, scarlet fever, cancer, alcoholism, and jaundice, all conditions, which in the early days of the Wassermann were supposed to invalidate the Wassermann reaction by giving false positives, in this series do not give a more frequent positive than negative. The rarity of a positive Wassermann reaction with alcoholism seems to bear out the statement of several later observers to the effect that alcohol will vitiate a positive reaction. It is interesting to note the frequency of a positive test among cardiac conditions of one sort or another—note especially the five cases of mitral diseases (stenosis and regurgitation), and the two cases of auricular fibrillation, who showed no other physical signs. In one of these cases of auricular fibrillation there was an indefinite history of syphilis. The cases of aortic disease showing the positive Wassermann reaction and no other evidence of specific disease, as can be seen from the table, are few. The fact that one out of three of the cases of erysipelas have positive Wassermann reaction is interesting, not all of the seven with positive tests showed unquestioned evidence of specific. The two cases where we diagnosed acute rheumatic fever in spite of a positive Wassermann test were cases which showed typical signs of an acute polyarthrititis. The typhoid patients, of which about one in four have a positive Wassermann test, at first made us wonder whether typhoid itself would give a positive test. This was all the more striking in that the first three typhoids upon whom we did Wassermann tests reacted positively.

From a negative standpoint, it is interesting to note the fact that among 270 married men and women, in 29 families there were histories of miscarriages. Out of these 29, 8 had positive Wassermann reactions, 3 doubtful, and 18 negative.

From this brief study, it seems to the writer that one may not tell in many of the cases admitted to the medical wards in general hospitals whether or not the patient's condition may be complicated by syphilis. Surely if one medical admission out of every six has positive Wassermann reaction, the doing of this test as a routine is valuable.

TREATMENT OF CENTRAL NERVOUS SYSTEM SYPHILIS.*

BY I. CHANDLER WALKER, M.D., BOSTON.

THIS paper is a summary of the treatment and its results in the first forty cases of central nervous system syphilis at the Peter Bent Brigham Hospital. These earliest cases are selected in order to rule out as well as possible remissions, relapses and temporary improvement. A period of one year in half the cases, and over a year in several others has elapsed since treatment was stopped. Cases of tabes, general paresis, cerebrospinal syphilis and syphilitic meningitis are considered; cases of purely cerebral syphilis are excluded.

This work extends over a period of two and one-half years; during the first year and a half the treatments were given by the writer, since this time and continuing through the present, by Dr. D. A. Haller. In the treatment of parasyphilis we have employed three methods,—one salvarsan alone, another the Swift-Ellis method, and a third salvarsanized serum alone intraspinally. We modified the original Swift-Ellis method as follows: maximum doses of salvarsan were given and the patient's blood was withdrawn one-half hour, rather than one hour, later; also for the intraspinal treatment, from 20 to 25 c.c. of whole serum, rather than a 40% or 50% dilution with saline was used. These modifications ought to increase the efficiency of the original technic, or should increase many times the amount of salvarsan or "whatnot" available in the serum for the intraspinal introduction in comparison to the original method. The time interval between treatments varied; usually patients were treated once a week; however, when a bad reaction followed treatment, the next week would be skipped. By occasional bad reaction is meant a severe aggravation of previous symptoms lasting more than twenty-four hours; usually there was some aggravation of previous symptoms, such as shooting pains coming on two to three hours after treatment and lasting for five or six hours; rarely any rise in temperature above 99°, rarely was morphia given. When the Swift-Ellis method was used, the patient usually spent two nights in the hospital, receiving salvarsan one day and the intraspinal serum the next. Many times, however, both salvarsan and intraspinal serum were given the same afternoon, the patient leaving the hospital next morning without any symptoms. Improvement was gauged by the patient's own feelings, by the spinal fluid cell count and by the Wassermann reaction. In the Wassermann reaction we used the cholesterinized heart extract and varying amounts of spinal fluid, different test tubes containing from 1 c.c. to 0.05 c.c. each; in this way it was easy to note resultant changes in the strength of the reaction. It might be stated that absolute reliance should not

* Read before the Suffolk District Medical Society, Nov. 17, 1915.

be put on the cell count in tabetics as we have noted that during severe paroxysms of pain in tabetics untreated and while under treatment, the cell count may be considerably higher than during a more quiescent period. However, this finding is not constant, but should be kept in mind. We have noted this variation only in tabetics.

In the first group, with salvarsan alone, we have treated seven cases of central nervous syphilis; five were tabetics, two of which had negative cell counts and negative Wassermann reactions in the spinal fluid. These two cases were quickly relieved of their pains temporarily, but required eight and ten doses before more permanent relief of pains and improvement in ataxia resulted. These cases have not relapsed. Another tabetic has had four series of six doses each in the past two years. Considerable improvement in ataxia and relief of pains followed treatment in each series, but improvement lasted for only a few months. The spinal fluid in this case is still positive in 1 c.c. amounts and the cell count is 7. This case has had much intramuscular mercury during past series of salvarsans. The other two tabetics received six doses of salvarsan, without any improvement. Of the non-tabetics, one was a case of syphilitic meningitis with a positive blood and positive spinal fluid in 0.5 c.c. amounts, a cell count of 940 (polynuclears 3, small mononuclears 62, large mononuclears 35). Patient had a chancre nine months previous and a rash seven months previous, followed by one salvarsan and three months of mercury by mouth. Patient was given four doses of salvarsan at weekly intervals, following which his spinal fluid Wassermann reaction was reduced to 1 c.c. positive with a cell count of 33, blood still positive; after two more treatments the patient was lost sight of.

The remaining case was one of cerebrospinal syphilis, with a positive blood and spinal fluid in 0.3 amounts, a cell count of 98. Following five injections of salvarsan, the spinal fluid cell count was 23, the Wassermann reaction was negative in 2 c.c. amounts, blood still positive.

Other cases have been started on salvarsan alone, but as no improvement in symptoms and laboratory findings were obtained after a few doses of salvarsan alone, these cases were then given the Swift-Ellis treatment, and these cases will be taken up now as Group 2.

In Group 2, using the Swift-Ellis method (salvarsan and serum) as we modified it, we treated 20 cases with a total of 143 intraspinal serum injections: 6 cases received four double treatments, 4 received five treatments, 5 received six treatments, 3 received ten treatments, 1 sixteen, and 1 twenty-three. These 20 cases were classified as follows: 11 tabes, 4 general paresis, 5 cerebrospinal syphilis. As previously stated, some of these cases were tried on salvarsan alone before the intraspinal serum was given, but as

no improvement resulted from the salvarsan, either symptomatically or in the cell count or in the Wassermann reaction, we then employed the Swift-Ellis method. Five tabetics were given from three to six doses of salvarsan, 1 case of general paresis was given three, and 3 cases of cerebrospinal syphilis were given respectively six, three and two doses of salvarsan without improvement. After this, to these 9 cases and the remaining 11 cases was given the Swift-Ellis modification.

In all of these 20 cases subjective symptoms, such as headache and pains, were relieved by two or three combined treatments. Ataxia responded less readily. Only one case has relapsed, and that one while under treatment. In six of these cases over a year has elapsed since treatment and in five more, nine months. No physical signs were changed, with the exception that a positive Romberg became negative in one case; in the nine cases showing ataxia this was relieved in eight and improved in one. The spinal fluid cell count in all cases excepting the one which relapsed became normal following four or five treatments. Before treatment eight of these cases had respectively a cell count of 166, 145, 128, 108, 90, 85, 80 and 63. The cell counts in the other cases averaged between 15 and 50. In 16 cases the spinal fluid Wassermann reaction was weakened by four combined treatments; in the three cases receiving ten treatments the Wassermann reaction was weakened from a positive with 0.05 c.c. to a positive requiring 0.4 c.c., and in the case receiving 16 treatments positive with 0.05 to positive with 0.6 and in the case which relapsed from 0.2 c.c. positive to 0.6 positive. All cases showed some diminution in the strength of the Wassermann reaction, and many, as noted above, showed considerable. However, none became negative in amounts greater than 0.6 c.c.

Since nine of the above cases showed little or no improvement following two or more doses of salvarsan, but did show much improvement symptomatically and a reduction in the spinal fluid cell count when the intraspinal serum treatment was used in conjunction with salvarsan, we desired to use the serum intraspinally alone on some cases. We felt justified in trying this method on cases with a negative blood Wassermann and a positive spinal fluid. We were further influenced by the scarcity of salvarsan, for if this method should prove successful, we could treat three cases with one large dose of salvarsan, that is, one case with salvarsan and two with this patient's serum.

Therefore, to a third group of 12 cases, 8 of which were tabes, 3 syphilitic meningitis, and 1 cerebrospinal syphilis, were given 150 intraspinal treatments with salvarsanized serum, the usual dose being 20 to 22 c.c. of undiluted serum, given usually at weekly intervals.

One tabetic whose symptoms were severe pains, with a spinal fluid cell count of 15 and a positive Wassermann reaction in 0.4 c.c. amounts,

was given 27 treatments in 10 months, at the end of which time the spinal fluid Wassermann was negative with 1 c.c., globulin and colloidal gold tests were also negative. The pains were relieved by the first few treatments. One year has elapsed and the laboratory findings are still negative, one cell in the spinal fluid, symptoms still absent. It might be stated that this patient got progressively worse while under salvarsan and intramuscular mercury previous to our treating him.

Another tabetic whose symptoms were pains, beginning optic atrophy, inability to walk more than a few steps even with assistance, with a cell count of 40 and 0.2 c.c. of spinal fluid positive, was given 12 treatments in 4 months. Pains were relieved, eyesight improved and ataxia improved, until now, nine months later, the patient is able to walk with a cane, to drive his horses and auto and to conduct a country medical practice. The Wassermann reaction is negative with 1 c.c.; the cell count is one, the globulin is $\pm$.

Another tabetic with pains, unable to walk more than a few steps by taking another's arm, with a cell count of 210, and 0.4 c.c. spinal fluid positive, was given 21 treatments in 10 months, then was able to work and walk without a cane; cell count normal; Wassermann reaction negative in 1 c.c. It is now 3 months since the last treatment without untoward symptoms.

Another tabetic with gastric crises and ataxia, cell count 103, 0.3 c.c. positive, was given 10 treatments, crises were relieved, ataxia slowly improved, cell count normal, 1 c.c. of spinal fluid gave a negative Wassermann. It has been 8 months since the last treatment, with no return of symptoms, and he has worked every day.

Another tabetic with pains and slight ataxia, cell count of 88, Wassermann 0.1 c.c. positive, was relieved of pains and ataxia, and the cell count was reduced to 2, following 4 treatments at weekly intervals. Seven more treatments were given at monthly intervals, following which 0.4 c.c. of spinal fluid was positive. The long interval between the latter treatments may explain the slow diminution in the Wassermann reaction.

Another tabetic with girdle pains and cell count of 20 was relieved by 3 treatments and cell count was reduced to 2; however, 7 more treatments did not influence the Wassermann reaction.

Another tabetic, with gastric crises and vomiting, was not relieved by salvarsan, but one serum treatment did relieve symptoms for 2 weeks; a second attack of crises and vomiting was promptly relieved for 3 weeks and a third attack was relieved for 3 weeks. Subsequently, 5 more treatments were given, but the attacks of crises and vomiting were not permanently relieved. The Wassermann reaction was reduced from 0.4 c.c. to 0.8 c.c. positive. Previous to serum treatment the attacks of crises were of a week's dura-

tion and came at weekly intervals; now only an occasional attack.

The remaining tabetic, with mild pains, slight ataxia, paresthesia and loss of sexual power, was given 7 treatments at varying intervals; the pains were relieved, ataxia was improved, sexual power returned and the Wassermann reaction was changed from 0.5 c.c. to 0.9 c.c. positive; at this time the blood became positive and salvarsan has been given.

Of the three cases of syphilitic meningitis, one had headache, stiff neck, positive Kernigs, interval strabismus, cell count of 550 and Wassermann reaction 0.1 c.c. positive. In two weeks he was given 3 doses of salvarsan of 0.3 gm., 0.5 gm. and 0.6 gm., respectively, 7 intramuscular mercury injections and Ki 30 grains three times a day. This treatment relieved the headache, but nothing else; cell count and Wassermann reaction unchanged. He was then given serum intraspinally without other treatment. The first treatment reduced the cells from 533 to 272, and relieved the strabismus and positive Kernigs. Five days later a second treatment reduced cell count to 100 and patient walked out of the hospital. A week later a third treatment reduced the cell count to 46. After this 14 more treatments were given at two-week intervals, and the cell count became normal and the Wassermann reaction in the spinal fluid with 1 c.c. was negative. However, the blood became positive and six doses of salvarsan were required to make the blood negative.

Another case of syphilitic meningitis in a child 3 years old, with headache, vomiting, stiff neck, positive Kernigs, opisthotonos, blood positive, spinal fluid positive with 0.1 c.c., cell count 9800, was given 0.2 gm. of salvarsan without effect. The first serum treatment reduced the cell count to 7300; second treatment reduced the cells to 2500 and the symptoms were relieved. Following this, three doses of 0.2 gm. salvarsan and 7 intraspinal serum treatments were given, also inunctions, and both blood and spinal fluid became negative, cell count normal. Four months have elapsed and patient is still normal except that deafness is unrelieved.

The other case of syphilitic meningitis, with headache, diplopia, external rectus paralysis, drowsiness, spinal fluid cell count 150, Wassermann 0.2 c.c. positive, was given 5 treatments; symptoms were relieved, cell count became normal and Wassermann reaction was not changed. Seven months have elapsed, and the patient still feels well, and has worked every day.

The case of cerebrospinal syphilis with headache, optic atrophy and early symptoms of acromegaly, was given 16 treatments, which relieved headache for 5 months; Wassermann reaction was changed from 0.3 c.c. to 0.7 c.c. positive. This is hardly a fair case on which to base judgment, as the symptoms and signs pointed strongly to one of pituitary tumor, and treatment was instigated to rule out the syphilitic involvement.

Therefore, to summarize: In those cases treated with salvarsan we used large doses; in those treated with serum intraspinally we used 20 to 25 c.c. of undiluted serum. Cases of syphilis of the central nervous system with only a positive blood react well to salvarsan; those with a positive blood and spinal fluid may react well to salvarsan alone, but they do much better when intraspinal serum is used in conjunction with salvarsan, and some who do not react to salvarsan alone do react well to the combined method. One may get improvement in general paresis from the combined treatment. Cases of syphilitic meningitis may clear up with salvarsan alone, but the combined treatment is the quickest. Cases of central nervous system syphilis with a negative blood and positive spinal fluid findings react readily to salvarsanized serum intraspinally alone, even when salvarsan has failed. The spinal fluid of the cases treated with salvarsan has become negative in two cases, whereas the spinal fluid of 7 cases treated with the serum alone has become negative. We feel that salvarsanized serum is a great asset in the treatment of syphilis of the central nervous system, and in the general run of cases we think the Swift-Ellis method is of great value and that this method in conjunction with mercury intramuscularly is the best treatment of syphilis of the central nervous system at the present time; and much improvement practically always follows such treatment.

Therapeutic and Preventive Medicine.

THE TREATMENT OF SYPHILIS.*

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SEVERAL years ago, in the out-patient department of a general hospital, a patient was sent from the Medical to the Skin Room with a note which read, "Has this patient got syphilis? If so, send her back and we will treat her."

For nearly four hundred years mercury had kept its place in the front rank of remedies for syphilis, being considered by many a true specific. Therefore, if the diagnosis was made, any one could give the treatment where a "cure" depended on "three years of mercury."

So firmly was the value of this treatment fixed in some medical minds, that if a patient suffered a relapse, or symptoms persisted, he was accused of failing to take his medicine in the manner prescribed.

When such faith in the curative power of

drugs exists, regardless of the natural history of the disease, there is little wonder that the promised cure of syphilis by a single injection of salvarsan appealed to many physicians not previously interested in the subject. Furthermore, the Wassermann test apparently supplied all the necessary help.

Clinical study seemed useless. With a positive blood test and the giving of sufficient salvarsan, the lesions must disappear and the patient recover.

However, a positive Wassermann is usually obtained in leprosy, the lesions of which do not respond to salvarsan, as shown by two cases recently so treated in this vicinity. Such false positives in no way detract from the value of the Wassermann test, which should be constantly employed. However, its results must be considered with the patient's history and physical examination, as an additional sign or symptom of the disease. There is still need of careful clinical training, for an early accurate diagnosis is the basis of successful treatment.

It is seldom necessary to wait for secondary manifestations, as *spirochaeta pallida* can usually be demonstrated in serum from primary sores, either with the dark field or in stained smears. The former is easier, but the latter satisfactory and reliable. We were able to demonstrate *spirochaeta pallida*, with dark field, in 96% of smears made from the last 97 primary sores examined at the Massachusetts General Hospital. The India ink method is unreliable and inexact. With this process, serum and ink are mixed on a glass slide, and a thin smear made. *Spirochaetae* do not stain with the ink, and are therefore not seen; and one must determine between various *spirochaetae*—artefacts, fibers, etc.,—by the hole they leave in the smear. The *spirochaeta dentium* may so closely resemble the *pallida* as to make the decision extremely difficult, even with a dark field. Wright's blood-stain usually gives satisfactory results. However, stained smears from the same lesion never show as large a number of *spirochaetae* as are seen with the dark field.

Patients must be taught the importance of seeking medical advice as soon as a possible primary lesion appears, and members of our profession must be properly trained and equipped for the task of making such diagnosis. Too great optimism on the part of either patient or physician may cause a costly delay.

Though there may be failure to find *spirochaetae* in a suspected sore, the Wassermann usually becomes positive before the appearance of secondary manifestations. We are thus enabled to begin medication during the primary stage, when the disease is most amenable to treatment. It seems well within the limits of conservative expectation that complete recovery will follow intensive treatment begun during the primary stage. The same is probably true of the early secondary period. By *recovery* is meant

* Read at a meeting of the Suffolk District Medical Society, Nov. 17, 1915.

relief from all clinical signs and symptoms, and a persistently negative Wassermann, the patient being kept under observation for four or five years if possible.

The security of the public health lies in the early, efficient treatment of the individual syphilitic.

Methnikoff has shown by his work on animals that infection with *spirochaeta pallida* does not occur if 33-3% calomel ointment is thoroughly rubbed into the site of inoculation *within one hour*. This fact was verified on some medical students who volunteered for the experiment. The Army and the Navy made practical use of this experimental work along preventive lines by supplying to their men the so-called prophylactic package, containing calomel ointment, with instructions for its use. This procedure was said to have shown promising results. In the Navy the prophylactic package has been discontinued by our present Secretary, as he felt that the giving out of such a package put a premium on immorality on the part of the men. Since the discontinuance of this practice there has been an increase of 7% in gonorrhea and undoubtedly an appreciable increase in syphilis.

The physician who pricks his finger, or otherwise wounds himself while taking care of a luetic patient, may ward off infection by applying the calomel ointment within the prescribed time. It should certainly be tried whenever possible.

Since the discovery of *spirochaeta pallida* as the cause of syphilis, early excision of the primary lesion has again been advocated; not with the expectation of aborting the disease, but in the hope of favorably modifying its subsequent course by removing many organisms with the primary focus. Sufficient proof is lacking to establish the value of this procedure. Furthermore, many lesions could not be removed, owing to their location.

Modern treatment of syphilis consists of the intensive but judicious use of salvarsan and mercury. Salvarsan should supplement but not displace mercury. This has been generally conceded, Wechsleman being a notable exception. He uses salvarsan alone, and goes so far as to claim that most of the untoward results of salvarsan are due to the combined treatment.

A full intravenous injection of salvarsan should be given, the amount to be determined by the patient's weight and general physical condition. Ordinarily .25 mg. per pound body weight, or .4 gm. for a man of 160 pounds, is the amount used. Women receive proportionately smaller doses. The mercurial treatment is started at once. Bichloride by mouth is ordinarily a satisfactory method to begin with. At the end of a week or ten days the injection should be repeated in the same or a slightly larger dose, if the first was well borne. A third injection of the same amount is given, ten to fourteen days later; and this is followed, in two or three weeks, by the fourth injection.

Intramuscular injections of mercury may now take the place of treatment by mouth, and either soluble or insoluble salts used. It is often more convenient for the patient to have weekly injections of salicylate of mercury in one-grain doses; or inunctions may be prescribed if the patient can and will use them. The treatment with mercury should be kept up for five months, then omitted for a month and a blood test made, which will often be negative in cases in which the treatment was begun during the primary stage.

If the Wassermann reaction is negative, a rest from treatment for three or four months may be taken. Then a course of mercury for two or three months should follow, and then a test. If negative, the patient should have a longer rest, and a two months' course of mercury twice a year for four or five years as a safeguard.

When the primary lesion has been the only symptom, a lumbar puncture and a study of the spinal fluid are probably unnecessary. With the foregoing treatment, it seems possible to abort the disease in a very high percentage of primary cases.

If the blood test at the end of the first course of treatment prove positive, the treatment should be repeated with three or four injections of salvarsan and the mercury as before.

The same line of medication should be followed where treatment is begun later in the disease; but the mercury should be kept up for a longer time. A positive Wassermann in a known syphilitic is an indication for more treatment.

Patients with infectious lesions should receive salvarsan at once, as it renders these lesions harmless quicker than any other form of treatment.

One should not rely on drugs alone. Hygiene, diet, fresh air, sleep, tonics—all play their part, as in other diseases. It is of little use to give salvarsan to the individual who has insufficient food, and there are times when rest, fresh air, and iron will do more for the patient than mercury.

During the course of syphilis, certain symptoms appear that yield in time to the general treatment, but that may be greatly benefited by certain forms of special medication. *Alopecia*, a manifestation greatly dreaded by patients, may often be checked by the addition to the general treatment of a bichloride wash for the scalp. *Nocturnal headaches* and bone pains yield to the addition of iodide of potash. *Iritis* often begins as a conjunctivitis, and is considered by the patient a "cold in the eye." It calls for the prompt use of atropine, which prevents adhesions and relieves pain. *Vitreous opacities* and changes in the retina and choroid are benefited by iodide and mercury. *Painful mucous patches* in mouth and throat yield to the judicious use of bichloride gargles and touching with tincture of iodine or chromic acid. *Late scaly papules* of palms and soles respond to salvarsan in a way that is little short of marvelous. Gum-

mata and late ulcerations of the skin and mucous membranes yield rapidly to a local mercurial dressing and iodide internally.

Salvarsan is of value in all these conditions, but at times cannot be applied, for one reason or another.

Many of the foregoing symptoms respond promptly to the treatment outlined; but the fact remains that salvarsan has a more marked effect in producing a negative Wassermann reaction.

Pregnancy occurring in a syphilitic woman, whether the infection be recent or remote, is an indication for energetic treatment for the welfare of the fetus; and the earlier the treatment is begun, the better will be the result.

Three or four injections of salvarsan should be given, and followed by mercury until confinement. Salvarsan has not caused abortion, as far as known, in any of our cases, and living children have been born in cases in which, without this treatment, a still-birth would undoubtedly have occurred. These babies are usually plump and healthy-looking; but may later have slight snuffles, glandular enlargement, red and shiny or desquamating heels, and there may or may not be lesions under the diaper. In the treatment of these infants mercury, with chalk stands in the front rank.

Nursing babies have seemed to derive benefit from salvarsan administered to the mother. Careful instructions must be given to prevent contagion from these babies. The writer has seen two old ladies with chancres of the eyelid, who were infected from handling or fondling congenitally syphilitic babies.

X-ray examination and the Wassermann test give us much definite information by which intelligent treatment of late syphilis of bones, joints, stomach, lungs, and great vessels can be carried out. The earlier these conditions are recognized, the better.

Much comfort and subjective improvement have been given certain cases of aortitis by repeated small injections of salvarsan. In cases in which the process has gone on to actual aneurysm formation, little, if any, improvement can be expected from salvarsan, and harm may result. In syphilis of the lung, small injections of salvarsan may be given; but salvarsan is contraindicated when general syphilis is combined with pulmonary tuberculosis, as the latter process may become more active.

Certain bone and joint conditions have responded to salvarsan, while others have made an equal or greater gain on iodide and mercury.

Salvarsan is contra-indicated in cases in which the renal function is diminished, while it has been of distinct value in certain cases of syphilis of the kidney.

In all these lesions of internal organs, the initial dose should be one-fourth the normal, and the amount increased with care.

Neosalvarsan is said to be slightly less toxic than salvarsan, is more easily prepared for in-

jection, but less efficient, especially in its effect on the Wassermann reaction. Some authors have placed its relative serologic activity as one to five.

The so-called neuro-recurrences after salvarsan occurred, for the most part, during the early days of 606, when subsequent injections were given at much longer intervals than is the custom at present.

Nausea, vomiting, headache, diarrhea, and perhaps slight chills and fever, may occur after an injection, but are less likely if a cathartic is taken the night before, and light diet precedes and follows an injection.

On account of the difficulty in obtaining either salvarsan or neosalvarsan, the Canadian product, sold under the name of Diarsenol, is being used. It is prepared for injection like salvarsan, requiring the same amount of sodic hydrate to make a neutral solution. Its therapeutic effect is apparently the same as the Ehrlich product, while the manufacturers maintain that Diarsenol is less toxic.

With the routine use of salvarsan, primary and early secondary lesions of skin and mucous membrane heal rapidly, and local treatment is often unnecessary. The value of direct application of mercury to syphilitic lesions has long been recognized.

Inunction, when thoroughly carried out, is dirty, but efficient. Metallic mercury seems more effective than its salts.

Iodine still has a limited place in the treatment of certain luetic conditions. Nocturnal headaches and the pain of periostitis are quickly relieved by iodides. Iodine seems to be of value in certain cases of syphilitic endarteritis, when used in conjunction with salvarsan, absorbing the syphilitic products, thus opening the way for the more potent drug. In the late ulcerations of the skin, iodides alone, or combined with mercury, act promptly. However, one should remember that, while iodides cause a rapid disappearance of lesions, mercury and salvarsan cure the disease.

Until recently a physician considered his whole duty was to the patient, believing it unwise to inquire as to the condition of his family or intimate associates. It is now a part of our follow-up work to see that the patient continues treatment, and that members of his family and friends who may have given or received infection, come for examination and treatment. The responsibility of bringing these suspects is placed on the patient if possible.

Syphilitics should be told the nature of their disease and the necessary precautions that must be taken. These instructions should be given like directions for taking medicine. Careful oral instructions are better than printed slips which the heedless will not read, and the conscientious do not require.

Introspective patients see syphilis in every pain or pimple that occurs years after their disease may have been cured.

Instructions should be given for the hygienic care of the mouth, with attention to broken or decayed teeth. By so doing the liability of painful and infectious lesions of the mouth will be diminished. A patient with early syphilis, requiring dental work, should tell the dentist his condition, and only urgent work should be done.

No other disease is so far-reaching in its effects on the individual and on the community. Acquired syphilis seldom kills its victim outright in the open, and so escapes conviction, but its results are to be found in deaths from apoplexy at an early age, heart and kidney disease, or involvement of the central nervous system. It is only recently that syphilis has been considered as the etiological factor in the causation of aneurysm of the aorta; but syphilis does not often appear in vital statistics as a cause of death in these foregoing conditions.

A study of syphilis of the second generation shows a high percentage of still-births and infant deaths during the early stages of the disease, revealing the true malignant character of inherited syphilis. Death returns are of little help in proving this point, as no effort is made in certain states to record the cause of still-births, and many babies dying of congenital syphilis have been tabulated as "marasmus," "cholera infantum," etc.

In many luetic families it is possible to tell from the history of miscarriages and early deaths, the approximate time at which syphilis entered the family.

That syphilis is one of the important factors in limiting the perpetuation of the species, is shown by the result of study of two groups, one of 30 families, the other of 100. In a study of 30 families with 168 pregnancies, 58% resulted in infant mortality. In the other group of 100 families with 633 pregnancies, 53% resulted in infant mortalities.

Of the children who escape an early death, some become state charges as feeble-minded, blind, or delinquent.

The one remedy for all this is the thorough treatment of every patient from the earliest opportunity until relief is secured.

It is impossible to more than guess at the relative frequency of syphilis as compared with other contagious diseases. That it outranks tuberculosis, there can be no doubt. It is probably more prevalent than diphtheria, scarlet fever and measles combined—barring epidemics. The expenditure of public money in the hospital control of these diseases, together with their early recognition and treatment, is responsible for the greatly reduced morbidity and mortality in these diseases.

At the present time there is no means whereby a patient with syphilis can receive aid from

town or state without automatically becoming a pauper.

Patients with tuberculosis receiving aid from overseers of the poor were also made paupers until exempted by special legislation (1907, Section 11, Chap. 287). Twenty-five per cent. of all cases of tuberculosis cared for in State sanatoria are exempt from pauperization because of that law. The same exemption ought to be extended to syphilitics.

The State should bear the expense of protecting the public from the infectious syphilitic. In no other contagious disease is the burden of expense of relief and control placed on the patient. For diphtheria, the City furnishes a hospital, and the State gives antitoxin. Hospitals are maintained for the care of smallpox, although the State requires universal vaccination and furnishes vaccine free. Large sums are expended in the relief and control of tuberculosis, and towns are required by law to maintain dispensaries for the examination and care of tuberculous patients.

Boston treats syphilis, as such, at Long Island, and there are a few beds available at the Massachusetts General Hospital. Infants and children are taken in the ward at the Boston Dispensary.

The State cares for its syphilitics in the Infirmary at Tewksbury, as required by law,—which means expense to the State of car fares, board, and medicine, and to the patient perhaps the loss of wages. Many of these cases could be treated as out-patients with little interruption to their regular employment, if there was some place near by where salvarsan could be given if necessary, at a minimum expense—the patient to pay all he could afford, the balance to be met by the town or State. Such an expenditure would be for relief and control, and might well be classed with the expense of free antitoxin, free vaccine, free anti-typhoid serum, and free laboratory tests.

There is another condition along this line that should also be remedied. At present if the overseers of the poor of some town assume the financial responsibility for a patient's treatment, it stops when they refuse further aid, regardless of the patient's needs. This has happened several times at the Massachusetts General Hospital, the local Board refusing to pay for more than one or two salvarsan injections. Questions like the amount of treatment a patient may receive, should not be left for a board of overseers of the poor to decide. They are usually short of money, and are anxious to keep down expenses.

Every syphilitic, acquired or inherited, may be infectious at some time, and a source of danger. The early lesions of syphilis are a public menace, while the late lesions are dangerous to the individual himself.

Energetic treatment of every syphilitic is thus demanded.

The expense to the State and money loss to the

family are shown by figures, which are only approximate. In 1909-10 it was estimated that 6% of blindness (average three fingers at 22 inches in front being called blindness) was due to syphilis. Five per cent. of feeble-minded cases (Waverley and Lancaster) show a positive Wassermann.

Syphilis shows in our insane hospitals, as paresis, tabetics, and cerebral syphilis,—11% for the State of Washington, 10% for the State of New York, and 9% for Massachusetts. Practically all cases of cerebral syphilis, central nervous syphilis, and general paralysis are diagnosed as general paresis in this State.

Some authors claim that tabes and general paralysis mean an antecedent syphilis. A conservative estimate places lues as the cause in over 90% of these cases.

That active early syphilis proves a real burden to the State, and loss to the individual, is shown by a recent and as yet unreported study of 100 men in the State Infirmary, whose combined stay in that institution was the equivalent of one man's stay for twelve years.

It has long been recognized that alcohol plays an important part in syphilitic infections. Idleness must also be considered. If men lose time from work on account of syphilis, it is no less true that many acquire syphilis when idle. Of those same 100 men at Tewksbury, all but two were out of work at the time of infection. Idleness usually means inadequate treatment, and the vicious circle grows larger.

Syphilis would undoubtedly be more prevalent if spirochaetae were longer lived outside the body. Experiments have shown that they live approximately four hours when left on a dry surface, and may remain alive 23 hours on warm moist gauze. Were it not for this relatively short life, extra-genital infections would occur much more frequently.

If we can accept the figures recently published in the *BOSTON MEDICAL AND SURGICAL JOURNAL*,* reprints of which were distributed by the Massachusetts Society for Mental Hygiene, syphilis is not as contagious as we believe it to be.

The article referred to was a study of sixty syphilitics who were said to have exposed 1227 individuals as follows:

134 by coitus,
442 in the family or boarding house,
651 fellow workmen.

Of the 1227 persons so exposed only five are reported to have become infected—one from a mother's kiss, the others from coitus. This small number of infections seems almost unbelievable when over 10% had a venereal exposure.

Professional confidence from the conscientious victim should be respected, and the opportunity given for coöperation. If a patient with infectious lesions fails to follow instructions and carry out treatment at the present time he

should be reported, by name and residence, to the local Board of Health, which has ample power to place him under restraint. The present law is sufficient to accomplish this. Such a patient endangers the community, and, as such, should be removed under the so-called "menace to community" law.

This being the age of preventive medicine, it can be applied to the treatment of syphilis in three ways:

1. By training young people to lead clean, proper lives, for their own sakes, thereby attaining as near physical perfection as possible. Fear of contagion may act as a restraint to a certain degree, but personal optimism, or overconfidence is responsible for a greater number of syphilitic infections than ignorance of the disease. Most people know that syphilis exists somewhere, but the friends they have selected are always considered above suspicion.

2. By prompt, intensive, intelligent treatment of every infected individual, begun during the primary stage, if possible, and continued until the patient is released by a clinical opinion supplemented by serologic findings.

3. By the enforcement of our present health laws:

(a) Requiring cities and towns in this state to care for all indigent persons afflicted with syphilis;

(b) Allowing no hospital supported in whole or in part by taxation to discriminate against the care of syphilitic patients, unless providing a hospital therefor;

(c) Restraining, as a menace to the community, infectious, irresponsible individuals who consider neither their own welfare nor the safety of their associates.

RECENT LITERATURE ON SYPHILIS.

THE RELATIVE IMPORTANCE OF THE HISTORY, THE PHYSICAL EXAMINATION, AND THE WASSERMANN TEST IN THE DETECTION OF SYPHILIS IN ROUTINE WORK.

HUBERT (*Münch. med. Woch.*, Sept. 28, 1915), in a short, but very interesting article, gives the result of the past three years' work in the first medical clinic in Munich, in an attempt to examine every patient admitted with a view to a possible syphilitic infection. Eight thousand and fifty-two patients were examined, and of this number 8.8% were found to be infected, 405 of them men and 354 women. Of this number, 52% of the men and 75% of the women did not know that they had or ever had had syphilis. This prevalence of latent syphilis in this class of patients, which was not brought out in the history or on any physical examination, must be of great importance, and often misleading in the diagnosis, prognosis and treatment of various diseases, especially cardio-vascular conditions.

In the cases of tabes, the Wassermann test was necessary to clear up the diagnosis in 56% of the men and 65% of the women, and the history of the tabetics failed to give even a clue in 25% of the men and 32% of the women. Hubert strongly urges the importance of a routine Wassermann test in general hospital work.

[E. L. Y.]

* Blaisdell: The Menace of Syphilis to the Clean-Living Public, *BOSTON MEDICAL AND SURGICAL JOURNAL*, April 1, 1916.

FAMILIAL SYPHILIS.

JEANS (*Am. Jour. Dis. of Chil.*, January, 1916) presents a study of familial syphilis based on the observation of 100 families in the pediatric clinic of the St. Louis Children's Hospital. The subjects particularly selected for investigation were the existence of syphilis in the mothers of syphilitic children, syphilis in the fathers, syphilis in the offspring of syphilitic parents, latent syphilis, total syphilis in the families studied, decreasing grades of infection in the offspring, non-syphilitic children of syphilitic mothers, and evidence of a neurotropic strain of spirochete. The author summarizes his conclusions as follows:

Germ transmission of hereditary syphilis has not been proved, and it does not seem likely that it ever occurs. It is highly probable that all the mothers of syphilitic children have been infected with syphilis. Of eighty-five mothers of syphilitic children, 86% gave positive Wassermann reaction. All of the remaining cases but six gave a history of infection or treatment, or both. Five of these six patients were examined at least ten years after the birth of their last syphilitic children and the infection is probably dying out. Eighty-seven per cent. of the mothers deny all knowledge of the infection. The mothers are for the most part infected during the latent stage of the father. Of 331 pregnancies in 100 families, 30% were abortions, 9% stillbirths, 61% living births. Of the living births 24% had died. Of those living 50% had syphilis. Of the total pregnancies, 90% were presumably syphilitic and although 10% seem free from syphilis, there is no proof that they all are. The total syphilis in these families amounts to 93% of the entire family. For the most part our families followed Kassowitz's rule; i.e. decreasing grades of infection in the children. In case of syphilitic mothers bearing non-syphilitic children, it is probable that the infection in the mother is localized in places where it is not readily transmitted. The idea that there are different strains of spirochetes receives some support from these families. Transmission to the third generation, though not proved, is distinctly an occasional probability.

[R. M. G.]

POISONING FROM SALVARSAN.

PHILLIP (*Munch. med. Woch.*, Sept. 14, 1915) describes a case in which the use of moderate dosage of salvarsan caused symptoms of arsenic poisoning. A critical survey of the cases reported to have had serious results following salvarsan injection show that these can be divided into three classes: first, where the fatality or serious result was due to the disease itself; second, where it was due to the presence, hitherto unsuspected, of a serious disease of some vital organ; and third, the very rare cases where an absolute or relative over-dosage caused symptoms of arsenical poisoning. Phillip reports a case coming under the last heading because he thinks it important. A boy of twenty-two came into the skin clinic at the hospital showing all over his body, face and extremities large areas of dark bluish red exanthema. Between these were blebs of varying sizes containing sanguineous fluid. The patient had a slight temperature and retention of urine. Catheterization showed 300 c.c. of urine in the bladder with no albumen or sugar. In a few days the condition cleared up very much, but there remained a marked keratosis of the skin of the palm of the hand, and the hair on his head had entirely gone. This patient had had only two doses of neo-salvarsan 11 days apart, of 0.45 gm. and two days after the last injection had a temperature which kept up for over a month until he was admitted to the hospital. The lessened amount of urine had been present for most of that time.

[E. L. Y., JR.]

CONGENITAL SYPHILIS IN ONE OF TWINS.

VANDER BOGERT (*Am. Jour. Dis. of Chil.*, January, 1916) reports a case of the occurrence of congenital syphilis, simulating mongolism, in the oldest child and in one of two younger twins in an Italian family. The other twin and a fourth child were entirely healthy. The author can assign no reason for the affection of one twin and not the other with the disease. The main interest in these cases lies in the congenital manifestation of syphilis in one of two twins, the other being uninfected; and the emphasis which they place on the likelihood of mistaking syphilis for mongolism. The similarity of the symptoms in these two conditions has probably been responsible for the belief that syphilis may be the cause of mongolism.

[R. M. G.]

Medical Progress.

RECENT PROGRESS IN NEUROLOGY.

BY JOHN JENES THOMAS, M.D., BOSTON.

HYDROCEPHALUS.

THE origin of the cerebrospinal fluid has received considerable study recently, which brings new light upon many of the clinical problems in which this fluid is of importance. It has been thought for a long time that this fluid was derived from the choroid plexuses. Dandy and Blackfan (*An Experimental and Clinical Study of Internal Hydrocephalus*, *Journ. Am. Med. Ass.*, Dec. 20, 1913, p. 2216; *Experimentally Produced Internal Hydrocephalus*, *Am. Jour. Dis. of Children*, Chicago, 1914, viii, p. 385) have produced internal hydrocephalus experimentally in dogs by placing an obstruction in the aqueduct, and they found that the fluid accumulated in the ventricles faster than it could be absorbed, and an internal hydrocephalus resulted, even when the choroid plexus of both lateral ventricles had been extirpated. This also resulted when the vena Galena magna was ligated near its origin, though not when this was placed more distally, owing to the efficient collateral circulation. They concluded that the cerebrospinal fluid is derived mainly from the choroid plexuses, probably both by filtration and by secretion. They could also produce an increase of this fluid by temporary compression of the jugulars, which ceases when the congestion is relieved by the collateral circulation. The cerebrospinal fluid is constantly formed and quite rapidly, and also absorbed, a new supply being formed and absorbed at least every four to six hours. Absorption takes place directly into the blood from the entire subarachnoid area, and is a diffuse process, while there is no absorption from the ventricles. Drugs and glandular extracts they found to have little effect on the rapidity of formation of the fluid, though pilocarpine produced a slight increase. The maintenance of the balance between the formation

and the absorption of the fluid is dependent upon a communication between the ventricles and the subarachnoid space, which is solely through the foramina of Magendie and Luschka. By injecting phenolsulphonophthalein into the subarachnoid space, by its prompt appearance in the ventricles, valves at these openings could be excluded. If an obstruction exists in the aqueduct of Sylvius, the phenolsulphonophthalein does not appear in the spinal fluid, so that the so-called foramina of Mierzejewsky and Bichat do not exist. They studied seven patients with internal hydrocephalus where they could demonstrate this lack of communication clinically. In each of these cases there was practically no absorption from the ventricles, while it was high from the subarachnoid space. Four cases of hydrocephalus in which the communication between the ventricles and the subarachnoid space was preserved were also studied, and in these there was a low absorption of fluid from the subarachnoid space. They thought the probable cause of the hydrocephalus in one case following the excision of a meningocele was because of the lessening of the absorbing surface, and consequent diminution of absorption of the cerebrospinal fluid.

Frazier and Peet (Frazier, C. H., and Peet, W. M., Factors of Influence in the Origin and Circulation of the Cerebrospinal Fluid, *Am. Jour. Physiol.*, 1914, xxxv, p. 268) in their experimental work found that so long as the fluid is widely distributed throughout the subarachnoid and subdural spaces of the brain and cord, it is not easy to determine where changes in the movement or constitution of the fluid take place. It is produced almost entirely in the four ventricles, which they also showed by closing the aqueduct which produced increase of intracranial pressure. Absorption is practically nonexistent in the ventricles—the lateral ventricle is practically only a reservoir. The cerebrospinal pressure has been found to vary with the pressure of the venous sinuses, and to be practically identical with it. Closure of the carotid circulation causes an immediate, but only temporary, fall of this pressure, but obstruction of the venous circulation is followed by a more or less constant increase in pressure. The rate of secretion of the fluid was found to vary greatly under normal conditions, and was practically uninfluenced by complete closure of both common carotids. The benefit from ligation of the common carotids, as has been done in cases of hydrocephalus, is not supported by the results of exact laboratory methods. By the phthalein test, the writers found 50 to 60 per cent. is absorbed within two hours, and they find that absorption is largely by venous channels, and that by lymphatic channels much less and more slow. Within ten minutes of an injection of phthalein into the lateral ventricles, it may be recovered from the blood in the torcula. As absorption is chiefly through venous channels, obstruction to venous outflow is immediately followed by a rise

in the venous pressure, by accumulation of cerebrospinal fluid, and an increase in intracranial tension. Dixon and Halliburton (Dixon, W. E. and Halliburton, W. D., The Cerebrospinal Fluid: I. The Secretion of the Fluid, *Jour. of Phys.*, 1913, xlvii, 215; III. The General Effects of Increasing the Cerebrospinal Pressure, *Jour. Phys.*, 1914, xviii, 317) believed that some product of the cerebral metabolism, perhaps similar to a hormone, is the essential factor in stimulating the secreting epithelium of the choroid plexus to activity. They have also shown the effects of an increase in intracranial pressure on various bodily functions. A moderate increase stimulates the respiratory, vasomotor and cardio-inhibiting centers, which is least marked in the respiratory center. When the pressure is increased to a point considerably above the normal arterial pressure, on the contrary, the respiration is inhibited, and ceases in a few seconds, while the other two centers continue to be active, with a consequent rise of arterial pressure, in spite of the slow heart, while a little later still the cardio-inhibiting center becomes paralyzed, with the vasomotor center still active, producing a still further rise in the arterial tension. Ultimately, however, this, too, becomes paralyzed and the arterial pressure falls.

Weed (Weed, L. H., Theories of Drainage of Cerebrospinal Fluid, with an Analysis of Methods of Investigation. Pathways of Escape from Subarachnoid Spaces with Particular Reference to Arachnoid Villi. Dual Source of Cerebrospinal Fluid, *Jour. of Med. Research*, Boston, 1914, xxxi, p. 51) working under the direction of Cushing, also carried out a series of experiments to determine the source and methods of absorption of the cerebrospinal fluid. He injected a solution of potassium ferro-cyanide and iron and ammonium citrate into the subarachnoid spaces during life, with subsequent precipitation of Prussian blue wherever the fluid penetrated in the head and neck, by fixation of the tissues *in situ* by a 1% solution of hydrochloric acid in formaldehyde. He concludes that absorption takes place chiefly in the venous sinuses. After injection of the fluid into the spinal subarachnoid spaces, he found the course of the fluid to be through the cranial subarachnoid spaces, into the great sinuses, and especially the superior longitudinal sinus, though all the other sinuses take part also in the process of absorption of the fluid. He also believes that the absorption is chiefly cranial because of the much more rapid absorption and excretion in the urine of phenolsulphonophthalein from the cranial spaces than from the spinal, after ligation of the cord and meninges in the cervical region. He finds that the cerebral vessels proper play no part in the absorption of the fluid under normal conditions of pressure, and that the subdural spaces also play no part in the process, since no connection exists between them and the subarachnoid spaces. The path of escape from the subarach-

noid spaces into the sinus he thinks to be by means of the "arachnoid villi." These are projections of the arachnoid into the sinus, chiefly about veins entering the sinus, and most numerous in those places where the great cerebral vessels enter. The arachnoid tissue, as it passes backward and inward in the wall, becomes myxomatous, and is covered at its top where it lies close to the endothelium of the sinus, by one or more layers of mesothelial cells through which and the endothelium the fluid passes into the sinus. Usually these villi are confined to the sinus wall, but in adults they may also project into the lumen, the myxomatous portion forming the ground work of the pachionian granulations. He also states that projections of arachnoidal mesothelial cells occur in all portions of the dura, especially about the sagittal and cavernous sinuses, serving as intradural channels for cerebrospinal fluid, thus accounting for the oozing of fluid from the dura when this is exposed during life. He believes the passage of the fluid through the villi is a filtration rather than osmosis or secretion, since the Prussian blue granules are found in the cells and lumen of the sinuses even with high concentration of the fluids injected, and retrograde passage of fluid through these villi takes place when there is obstruction to the venous circulation within the cranium. The lymphatic system, he thinks, plays an accessory part in the absorption of cerebrospinal fluid, since after injection into the subarachnoid spaces, Prussian blue is found in the cervical lymph channels and nodes in the perineurial lymph spaces of the cranial and spinal nerves. Large amounts of Prussian blue were found especially about the olfactory nerves, in the surrounding connective tissue, and in the lymph spaces of the nasal mucous membrane. Weed cites several cases where the fluid containing potassium of cyanide ran out of the nose during the injection. That is, in short, Weed thinks the drainage of the cerebrospinal fluid is mainly by filtration through the arachnoidal villi from the subarachnoid spaces into the venous sinuses, and to a lesser extent along the perineural spaces of both cranial and spinal nerves to the lymphatic vessels.

Weed thinks the chief sources of the cerebrospinal fluid are from the choroid plexuses of the cerebral ventricles and the perivascular systems of the nervous tissues. He introduced a cannula directly into the third ventricle from the fourth. When the cannula was introduced there was at first a rapid flow of several drops, followed by a gradual diminution, and finally after three or four hours, all flow ceases. The fluid obtained in this way appeared identical with that found in the subarachnoid spaces. If the direction of the flow of fluid in the perivascular spaces, which are found about the cerebral vessels, were shown, we should have further information in regard to another possible source of the cerebrospinal fluid. By subarachnoid injection of the cyanide solu-

tion, Weed found no granules of Prussian blue in the perivascular spaces, when low pressure was used. With medium pressure these granules appeared in the perivascular and pericapillary spaces, but not in the vessels themselves. Using high pressure for the injection, granules were sometimes found in the lumen of the capillaries. These results point to a flow from the capillaries into perineural and perivascular spaces, and so into the subarachnoid spaces, where the fluid mixes with that from the ventricles, and, therefore, to the dual source of the cerebrospinal fluid from the choroid plexus and the cerebral capillaries.

Weed and Cushing (Weed, L. H., and Cushing, H., *Studies on Cerebrospinal Fluid, Effect of Pituitary Extract on its Secretion (Choroidorrhea)*, *Am. Jour. of Phys.*, 1915, xxxvi, p. 77) also introduced extracts of the posterior lobe of the hypophysis intravenously and measured the secretion of cerebrospinal fluid by introducing a cannula into the third ventricle. They thought it produced an increase in the secretion of cerebrospinal fluid, and were able to exclude a simple increase of expulsion of fluid already formed, due to physical conditions resulting in changes in the volume of the brain. They conclude that extracts of the posterior lobe of the hypophysis increase the rise of production of cerebrospinal fluid (choroidorrhoea) by stimulating the secretory activity of the choroid plexuses.

Of possible great practical importance is the fact that Frazier found in marked contrast to all other glandular extracts that he could produce a prolonged and continued decrease in the flow of the cerebrospinal fluid by the use of the extract of the thyroid gland, and this wholly irrespective of the effect on the blood pressure.

Helle (*Arch. für klin. Chir.*, 1914, cv, p. 501, *Zur chirurg. Behandlung der Hydrocephalus int. durch Ableitung der Cerebrospinalflüssigkeit nach der Bauchhöhle und nach der Pleurakuppe*) reports two attempts at surgical drainage of the cerebrospinal fluid in two cases of hydrocephalus. The first was in an intelligent boy of eight, with contracture and spastic paraplegia. Callosal and lumbar puncture had been tried, with only temporary improvement. He therefore implanted a stretch of vein from the lumbar dural cavity into the abdominal cavity. This gave good results for a time, but finally failed, and he then drained by rubber tubing on the other side, and this gave much relief, and five months after the procedure the contractures had subsided, and from being helpless since birth, he was learning to walk and could get about without help. The rubber drain used was 5 mm. in diameter and led from the lower end of the dural sac to the abdominal cavity in the triangle of Petit, above the ilium, passing between the external and internal oblique muscles. In the second case of external hydrocephalus, he diverted the fluid into the top of the pleural cav-

ity, which was not opened, by means of rubber tubing, slipping over the lower end to reduce friction the lower end of a segment taken from the neighboring jugular vein. Two months after the operation there had been no reaction, and the choked disc, headache and vertigo had disappeared.

MENINGITIS.

Merkul (*Deut. Zeitsch. f. Chir.*, 1914, cxxx, 1) reports two cases of meningitis after contusion of the skull or spine, and adds several similar cases from the literature. In his cases, a persistent spinal meningitis followed about six days after a fall injuring both skull and spine, and followed by unconsciousness for a time. In neither case was the skin broken, but one of the men had had a boil on the neck about two months before, which had been incised. No streptococcus or staphylococcus could be cultivated from the cerebrospinal fluid in either case. In one case a few Jaeger's cocci were found. In this case cure followed upon lumbar puncture which was performed twice, with an interval between of fifteen days, and 15 and 10.5 cc. of fluid drawn. In this case there was a great deal of pain and hyperesthesia and intermittent fever, going up to 38.7° C. at times. In the second case the skull was fractured but the meningitis seemed to be spinal only. Transient relief was obtained by lumbar puncture and then constant drainage by laminectomy was tried, and complete recovery followed. The writer recommends this procedure when relief does not follow lumbar puncture, or if the fluid, at first serous or sero-purulent, becomes purulent. Barth (*Chir. Behandlung der eitrigen Meningitis, Arch. f. klin. Chirurg.*, 1914, cv, 653) also advised laminectomy and drainage for the treatment of purulent meningitis, and reports three successful cases. He advised the removal of two or three middle or lower lumbar arches, quite low down, and drainage by tube, and not gauze. His first case was a young man who had been stabbed in the spinal cord, at the ninth thoracic vertebra, and developed a purulent meningitis. He first opened the canal at the point of the trauma, but, as the fever persisted, he then opened at the second or third lumbar vertebra also, and drained the dorsal sac above and below, and prompt recovery followed. The second case was one of purulent meningitis following fracture of the base of the skull, in a man of 37. Laminectomy was done after five lumbar punctures had been tried, with only transient relief. The third case was also traumatic in a young woman who had fallen on the street. Barth calls attention to the resemblance of these cases to those of peritonitis, and argues that if that can be cured by early operation, these cases can be also, and calls attention to the course of beginning meningitis from mastoid disease. He waits until there is leucocytosis of the cerebrospinal fluid and then drainage of the lumbar dural sac has practically lost its dangers. He

considers that infections occurring through the lymph channels are curable by operation, but that not those arising through the blood-stream, nor the direct infections.

Krever (*Russky. Vrach, Petrograd*, 1914, xiii, 901) writing of pneumococcus meningitis, distinguishes two distinct forms, which vary as to prognosis, and according to the place of origin. One form of the pneumococcus infection of the meninges is secondary to a pneumococcus infection such as a croupous pneumonia, otitis, sinusitis, or endocarditis, and has a decidedly unfavorable prognosis. His second form of infection is from the naso-pharynx, through the blood, and this he considers to be distinctly more favorable in outlook. Krever thinks this difference is due to the varying virulence of the virus which is more active in the former type of meningitis, and leads to a purulent meningitis which is usually fatal, while coming from the nasopharynx the micro-organisms are generally less virulent, and generally produce only a sero-fibrinous or a hemorrhagic inflammation which is less dangerous. Krever, however, gives no explanation of why the micro-organisms should be less virulent in his second mode of infection.

Bokay (*Heilungsmöglichkeit der Meningitis tuberculosa, Jahrbuch für Kinderheilkunde*, 1914, xxx, 133) in a most interesting article, analyses 34 cases of recovery from tuberculous meningitis from the literature, and adds three cases of his own. This array of cases is striking in view of the fact that a diagnosis of this disease is generally considered equivalent to a death sentence, and causes most physicians to give up efforts to cure, and show the change of view in regard to this disease produced by the more accurate methods of diagnosis introduced through examination of the cerebrospinal fluid. Bokay found no cases of recovery in children less than two years of age; while the proportion of recoveries increased in children from five years of age up, though only 10 per cent. of the cases were in children over seven. The recoveries generally were in cases where the active tubercular process was limited to the meninges, and other organs were not infected, and in those in which there was no marked number of tubercles. Aside from hyperaemia, the only method of treatment that contributes to recovery is the surgical one of laminectomy and drainage. The author considers the cases of recovery after repeated lumbar punctures as being due as much to natural resistance as to the method of treatment.

CHOREA.

Passini has reported (*Lumbalpunktion bei Chorea Infectiosa, Wiener klin. Woch.*, 1914, xxvii, 1363) some interesting observations on the effects of lumbar puncture in infectious chorea. He remarks that this disease has been removed from the class of diseases of the nervous system to that of infectious diseases, and states that

recent researches have apparently shown that the symptoms of chorea are due to irritation of the cerebral tracts passing from the red nucleus to the dentate nucleus. He examined the cerebrospinal fluid in a number of cases of chorea developing subsequently to acute arthritis or endocarditis, though all were free from fever at the time of puncture. In five severe cases the fluid was found under high pressure, but clear and apparently sterile. In three of these cases the chorea subsided quickly and permanently after the lumbar puncture. In the two other cases, in both of which the symptoms had existed for a year, no benefit followed. On repetition of the lumbar puncture later, there was normal pressure, but no improvement in the choreic movements. He concludes that the nervous system had suffered beyond recuperation, either from the pressure or from toxic elements in the cerebrospinal fluid, and that before this has occurred, lumbar puncture has a direct curative action.

VENTRICULAR PUNCTURE IN EPILEPSY.

Stied (Weitere Erfahrungen mit der Balkenstich speziell bei Epilepsie, Idiotie und Verwandten Zustände, *Arch. f. klin. Chir.*, 1914, cv, 277) describes the experience of the Halle clinic with puncture of the corpus callosum in cases of epilepsy, idiocy and similar conditions. It was performed 19 times on seventeen patients. The results were not striking, though Stied expresses himself hopefully in regard to the effect, if the method can be used earlier. In many of the cases, including those of genuine epilepsy, he found diminished brain pulsation, but after the withdrawal of a few cubic centimeters of fluid, pulsation returned, which shows how the conditions in regard to the cerebral circulation are influenced by the procedure. In one case of epilepsy beginning at puberty, the attacks became milder and much fewer during the two years following the puncture. Then they returned in a mild form, but were almost entirely stopped again for four years by repeating the puncture. In another case of epilepsy since childhood with hydrocephalus and imbecility, the attacks stopped for several weeks after the puncture, and after that were much less frequent and less severe. In still another very severe case, attacks were stopped for six months, and were again banished by a repetition of the puncture when they recurred. Stied saw no ill effects from the procedure and more or less benefit except in two cases. He punctured 2 cm. back of the coronal suture and 1.5 cm. out from the median line, and in the plane of the praecentral fissure, and 2 cm. in front of a perpendicular at the anterior border of the exterior auditory canal.

Yawger (Tuberous Sclerosis and Other Unusual Features of Epilepsy, *Jour. Am. Med. Assn.*, 1914, lxiii, 1348) reports two unusual cases of epilepsy, one in a girl of 14, an Italian, where the attacks began at the age of 7. She

was epileptic and imbecile with major attacks, and had one attack of status which lasted for 11 days. She was small, with short legs, and hands reaching almost to the knees; features were thick and abdomen was protuberant. She improved under administration of thyroid extract and had no attacks for six months, and then relapsed. There were many small papular tumors on the body, more numerous on the face and about the nose and mouth, and telangiectases. These were also present on the forehead, neck, arms, hands, and a few on the hips. The second case, a Slavie girl of 15, was also epileptic and imbecile, and showed similar tumors, mostly on the face, telangiectases, and a few fibromata, also a large, flat naevus to right of the lumbar spine. The writer calls attention to articles by Schuster and Wienwenfinijse on similar cases.

(To be concluded.)

Book Reviews.

Syphilis as a Modern Problem. By WILLIAM ALLEN PUSEY, M.D., Professor of Dermatology in the University of Illinois. Chicago: American Medical Association. 1915.

This monograph is reprinted by the American Medical Association from the commemorative volume which it published last June "as a tribute to the medical sciences which made possible the building of the Panama Canal and the Panama-Pacific Exposition," and represents one of the efforts of the Association for public enlightenment on health matters. Though written primarily for the laity, it is of equal interest and moment to the profession; for it deals with the subject of syphilis from the standpoint of its problems as they affect the individual and society. The history, course, pathology, prognosis, etiology and prophylaxis of the disease are consecutively considered in a series of twelve chapters. The last is of particular importance, for it advocates, in addition to social, moral, and hygienic measures, and instead of the legal recognition of prostitution, universal knowledge of the use, value, and efficacy of 33% calomel ointment as a preventive of infection. The book is in every way praiseworthy for its fearlessness of statement, scientific accuracy, and dispassionate temperateness of tone.

Mothercraft. By SARAH COMSTOCK. Illustrated. New York: Hearst's International Library Company. 1915.

On the whole, the author has given us a satisfactory little book on her subject. Her style at times is not all that could be desired.

The chapter about the baby's clothes is excellent, but the one on prenatal care is meagre. The author's advice about knowing the dairy from which the baby's milk is to be obtained is excellent, but why does she fail to mention the very important point of having the milk from a tuberculin tested herd? Her advice to wash out the baby's eyes each day with boracic acid solution is open to criticism, and it surely is a great omission that there is no word on ophthalmia neonatorum in the book.

The illustrations do not add to the value of the work.

The Practical Medicine Series. Volume V. Pediatrics edited by ISAAC A. ABT, M.D.; Orthopedic Surgery edited by JOHN RIDLON, A.M., M.D., and CHARLES A. PARKER, M.D. Chicago: The Year Book Publishers. 1915.

This fifth volume in the Practical Medicine Series of 1915 includes in one compendium the progress in pediatrics and orthopedic surgery during the preceding year. The subjects of pediatrics, which compose more than three-fifths of the work, are adequately presented and illustrated by seven full page plates and fifteen figures in the text. It hardly seems, however, that the large field of orthopedic surgery is sufficiently represented in the sixty-two pages devoted to this subject. Only one plate and six text figures are employed. It would seem that this subject were of sufficient importance to deserve another year an entire volume in the series.

Sixteenth Annual Report of the State Board of Insanity of the Commonwealth of Massachusetts, for the Year Ending November 30, 1914.

This report covers the work of the reorganized Board of Insanity, which reorganization was acted upon by the legislature in July, 1914, and took effect August 1, 1914. The appointed members are Dr. Michael J. O'Meara, chairman; Dr. L. Vernon Briggs, secretary; and Mr. Charles E. Ward, treasurer. The Board has established the policy of appointing no staff officer who has not had previous experience in caring for the mentally ill or who has not taken some special course in this work. Arrangements, therefore, were made with the Psychopathic Department of the Boston State Hospital to give special courses of from three to six months to prospective candidates in order that they may attain the necessary qualifications. The Board has further arranged for inebriate women to be committed to the Westborough State Hospital alone, where a ward of 40 beds has been set apart for the treatment of cases of dipsomania, and all female inebriate patients, inmates of other state hos-

pitals, have been transferred to Westborough. In August the Board determined upon a policy for out-patient work by the state hospitals, and at its request, Dr. A. Warren Stearns, assistant to the Board, made a survey of what was then being done in all the institutions under charge, it being the desire of the Board to stimulate each hospital to reach out into the community and be responsible for the mental health of the district which it covered. For more than twenty-five years the Massachusetts School for the Feeble-minded has conducted an out-patient clinic at the school once a week, and since 1885 insane patients of the harmless type have been placed at board in private families. In January, 1913, the Psychopathic Department of the Boston State Hospital opened the first out-patient department to be conducted by any hospital for the insane in this state. Over 1000 new patients visited the clinic during the first year, and active social service and after-care were begun. Following this plan, there have been opened out-patient departments in the following hospitals: Worcester State Hospital, Taunton State Hospital, Northampton State Hospital, Danvers State Hospital, Boston State Hospital, Worcester State Asylum, Monson State Hospital, and the Massachusetts School for the Feeble-minded. Clinics have been established in the following cities and towns: Boston, Fall River, Gloucester, Greenfield, Haverhill, Lynn, New Bedford, Newburyport, Pittsfield, Spencer, Springfield, Taunton, Waltham and Worcester. In the large cities the clinics are held in the hospitals themselves, others are held at general hospitals or public buildings. These clinics are conducted by members of the staff of the nearest hospital. Physicians in the community are notified of the dates of such clinics and are invited to send patients for consultation and treatment. Advice and treatment are given free to all cases of nervous or mental diseases who apply.

Students' Text-Book of Hygiene. By W. JAMES WILSON, M.D., D.Sc., D.P.H., Bacteriologist to the Counties of Down and Antrim, Lecturer in Hygiene and Public Health, Queen's University, Belfast. New York: Rebman Company. 1915.

This volume, which is based on the author's lectures in hygiene at Queen's College, Belfast, is especially written for medical students. The principles of the science are dealt with in a series of twenty appropriate chapters and the practical application of these principles is indicated. Details of analytic methods are wisely omitted. The work is illustrated by a series of twenty-six well selected figures printed as full-page plates on special insert paper. This Irish work on hygiene should prove useful, not only for students, but for teachers, sanitary inspectors and all others interested in public health.

Oxford Medical Publications. Practical Prescribing and Treatment in the Diseases of Infants and Children. By D. M. MACDONALD, M.D., F.R.C.P.E. London: Henry Frowde and Hodder and Stoughton. 1915.

This small book first gives some points on prescribing, followed by a long dosage table, prepared in accordance with the British Pharmacopoeia. It then gives a short chapter on Infant Feeding, which shows the author's absolute ignorance of this important subject. Then follows a short chapter on the preparation of various foods. Next comes a therapeutic index with directions for the treatment of various diseases. An idea of this chapter can be gained by the fact that heart disease, herpes, hicough, hoarseness, hysteria and ichthyosis follow each other. Later is given a chapter headed "Notes on Drugs," in which some of the uses which may be made of the drugs are detailed. Then follows a long chapter on Diseases of the Eye. We fail to see why there should not also be a chapter on Diseases of the Ear as well, but this is lacking. Finally, the book closes with a chapter on Tuberculin and the Tuberculous Child, by Dr. Halliday Sutherland, which is very good. Outside of this chapter we fail to see anything in the book to recommend and much to condemn. We know of nothing which will do more to hinder the development of the proper practice of pediatrics than a book of this sort.

Physiological Chemistry. Text-Book and Manual for Students. By ALBERT P. MATHEWS, Ph.D., Professor of Physiological Chemistry, University of Chicago. One volume of 1042 pages, octavo, illustrated by cuts, tables and diagrams. New York: William Wood and Company.

From Professor Mathews, who has had such a long and varied career as an investigator and teacher of physiological chemistry, we should, of course, expect only a valuable exposition of this subject in any book of which he was an author; nor have we been disappointed in our expectations.

Beginning with the simplest biological elements, he has built up step by step, the various structures of animal life to their completed whole. From the intricate and fundamental character of his investigations, one would expect a work so abstruse that those less grounded, would fail to grasp his presentation of the subject; here, again we are happily disappointed in the clear and forcible manner in which it is presented and in which apt illustrations clarify an otherwise deeply complicated subject.

The most practical methods of isolation and purification of these biological products are

given with a clearness and completeness which will enable anyone at all versed in laboratory methods to reach the desired goal of isolation of the purified product.

To have to give up our old term "hemoglobins," and to see them pose as "chromoproteins," may cause a bit of sadness to those trained in the old school, but this author approves of the new term and we must submit with resignation.

We usually shy, however, at the lipo-proteins, until more evidence is given of their existence in nature. An excellent description of the nature and properties of the amino-acids, those structural stones of which the protein molecule is built, is given, with much which is new and up to date.

A very good table of food analyses and caloric values is included, but as we are no longer "cave men" one could wish that more attention were given to the values of cooked food rather than raw, which would make them more valuable to dietitians.

Digestion is fully treated with all the newer facts learned from the school of Pawlow and others, in which, though a full discussion is given, we learn that the author is rather inclined to believe in the identity of pepsin and rennin.

An admirable presentation of the nature and excretion of cholesterol and its relation to gall-stone formation will prove of great interest to those who have investigated this very abstruse subject.

The chapter on cryptorhetic tissues, a term coined by the author, including the thyroid, parathyroid and reproductive glands, as well as the hypophysis, and on the nature of their secretions, is so clear, and the subject is presented in such a modern phase, that it alone would amply repay one for the cost of the book.

It is rather surprising to find that the author recognizes the uricolytic enzyme in the human, basing his results upon the investigations of one author alone, whose statements against the destructive effects of alkali have been called into question by all others who have labored on the same line of work. It would seem that when one investigator secures results which no others are able to confirm and his methods are brought into question, the results of the many would overwhelm those of the one.

It gives considerable satisfaction to find that the author has not joined those advocates of the minimum protein ration who have held the floor so long, but is more inclined to believe in a slight excess of protein as an insurance against emergencies.

There is, as would be expected, an excellent index as well as a complete bibliography for those who care to pursue particular lines of investigation still farther.

On the whole, no work on this subject has appeared which deserves greater commendation than the one which we have before us.

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NATIONAL SUGGESTIONS FOR STATE LEGISLATION.

ON May 4, 1914, there was introduced before the National Congress a bill (Senate No. 5475) for the establishment of a bureau for the study of the criminal, pauper and defective classes in the United States. The chief provisions of this bill were as follows:

"Sec. 1. That there shall be established in the Department of the Interior a bureau for the study of the abnormal classes, and the work shall include both laboratory investigations and the collection of sociological and pathological data, especially such as may be found in institutions for the criminal, pauper, and defective classes. Said bureau and work shall be in charge of a director, who shall be appointed by the President, by and with the advice and consent of the Senate, and shall receive a salary of \$3,000 per annum. He shall make a report once a year, directed to the Secretary of the Interior, which, with the approval of that officer, shall be published. For the aid of the director there shall be one psychologist at \$2,000 per annum, one translator at \$1,400 per

annum, two clerks at \$1,200 each, and one stenographer and typewriter at \$1,000.

"Sec. 2. That the director, if necessary for the proper discharge of his duties, may place himself in communication with State and municipal and other officials of this and other countries.

"Sec. 3. That for the proper equipment of and carrying on the work of said bureau, the temporary employment of specialists, and the purchase of instruments of precision, books, and periodicals, and rental of rooms, if necessary, there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$5,000, or so much thereof as may be required."

At the time, this bill was read twice and referred to the committee on the judiciary. Its plan of work was endorsed by the American Bar Association and by several medical societies. Though this measure failed of passage, the plan has been commended to state legislatures, and it is possible that similar measures may be introduced during the present session of the Massachusetts General Court.

Other national suggestions for state legislation have recently been made, with particular reference to the local enforcement of the federal antinarcotic law. Dr. M. I. Wilbert of the Division of Pharmacology of the United States Public Health Service, in a recent paper,* has said that this law cannot be ideally enforced without suitable amendments to many state laws which contain exception clauses subject to abuse. It is his suggestion that the five following requirements should be included in all state antinarcotic legislation:

"1. A further restriction of the quantity, as well as the kind, of drugs that may be sold without providing a satisfactory record.

"2. A satisfactory definition of the rights and privileges of practitioners of pharmacy, medicine, dentistry and veterinary medicine.

"3. A provision for the revocation of licenses to practise pharmacy, medicine, dentistry or veterinary medicine that may be held by habitual users of habit-forming drugs.

"4. A provision for the revocation of the license to practise any of the above professions after conviction under the federal or state laws designed to restrict the sale or use of narcotic drugs.

"5. An adequate appropriation to secure the effectual enforcement of the several requirements embodied in the state law by an established department, board or commission. The penalties

* Weekly Report, United States Public Health Service, Jan. 21, 1910, Vol. XXX, No. 3, p. 114. This paper was read at the meeting of the American Society for the Study of Alcohol and other Narcotics, at Washington, D. C., December 16, 1915.

imposed should be in accord with those imposed under the federal anti-narcotic law, and for the second offence, at least, should include the possibility of imprisonment, in the discretion of the court.

"In conclusion, it cannot be too strongly emphasized that laws designed to restrict the abuse of narcotic drugs are, primarily, public health measures, and that the economic problems that may be involved should be considered as being of but secondary importance."

Without further comment, these national suggestions for state legislation are here presented for what interest or value they may offer to physicians and legislators.

UNIVERSITY REGISTRATION STATISTICS.

In the issue of *Science* for January 21 are published the registration returns of thirty of the large universities in the United States for the academic year 1915-16. It is specified that these institutions are not necessarily the largest or the leading universities of the country. In this report it is interesting to note the relative gains and losses of several universities. By far the largest gain,—2375 students,—was made by the University of California. Four of the large universities,—Tulane, Washington, Harvard and Princeton,—showed a decrease in total attendance; and Western Reserve and Wisconsin showed decreases exclusive of the summer sessions. If the summer enrollment be omitted, however, the gain of the University of California falls to 363, whereas the University of Pennsylvania made a gain of 916 in the enrollment of its winter session. Including the summer sessions, the ranking order of the largest of these thirty universities is as follows: Columbia, California, Chicago, Pennsylvania, Wisconsin, Michigan, New York, Harvard, Cornell and Illinois. In the academic year 1914-15 the ranking of the largest universities was Columbia, California, Chicago, Wisconsin, Pennsylvania, Harvard, Michigan, New York, Cornell and Illinois. Exclusive of the summer sessions, the ranking of the universities in 1915-16 is Columbia, Pennsylvania, California, New York, Michigan, Illinois, Harvard and Cornell. In the previous year the order of these universities was Columbia, Pennsylvania, California, Michigan, New York, Harvard, Illinois and Cornell.

Comparing the undergraduate departments, the largest universities in the following order are California, Harvard, Michigan, Minnesota, Chicago, Wisconsin, Columbia, Nebraska, Texas, Kansas, Iowa and Yale.

The ranking of the medical schools of the several universities is as follows: New York, Michigan, California, Johns Hopkins, Tulane, Harvard, Pennsylvania, Minnesota, Northwestern, Illinois, Ohio, Texas and Chicago.

PSYCHOLOGICAL STUDY OF CRIMINALS AT THE MASSACHUSETTS STATE PRISON.

IN the issue of the *JOURNAL* for January 20, 1916, we commented editorially on the psychological study of criminals at the Massachusetts State Prison, of which the first and second reports appeared in Bulletins 13 and 16 of the Massachusetts State Board of Insanity. In the latest bulletin (No. 17) of this Board appears a third communication presenting the results of the completed psychological examination of three hundred criminals. This investigation was conducted by Mr. C. S. Rossy, not by Dr. Stearns, to whom we erroneously attributed it in our previous editorial. The cases are tabulated with reference to their offence, mental age in terms of the Yerkes-Bridges point scale, and the diagnosis. Other tables show the distribution of cases, serving sentence for crimes of various groupings and classifications. The conclusions from this investigation are summarized by Mr. Rossy as follows:

"1. In continuation of the investigation undertaken at the Massachusetts State Prison by the State Board of Insanity, a psychological examination has been given to 200 more inmates of the institution.

"2. The total number of examinations made up to date is 300.

"3. Of these 300 subjects, 22% are found to be feeble-minded, 9.6% border-line cases, and 3.3% presumably psychotic.

"4. The 22% feeble-minded subjects are custodial cases in so far as their deficient mentality and significant history indicate the need of supervision."

The result of this examination constitutes a valuable further contribution to the accumulating data bearing upon the psychological status of criminals of various types and the relation of crime to mental defect

A WORD TO MEDICAL SPEAKERS.

It has been traditionally said that physicians are habitually poor writers and public speakers, presumably from their lack of training in literary expression and in elocution. As a matter of fact, we believe that, in the matter of writing, this reproach has largely been removed from the profession of the present day. In regard to public speaking, however, it appears that there is still room for improvement. It has recently been called to our attention by a physician whose hearing we know to be excellent, that he has suffered much inconvenience and vexation at medical meetings from the failure of readers and speakers to raise their voices and to speak with sufficient distinctness to make themselves readily understood. Many readers enunciate well enough while facing the audience, but when turning away towards a blackboard or lantern screen, project their voices directly away from the audience, which thus becomes unable to follow their remarks. A little thought and pains on the part of medical speakers in this respect not only would augment the pleasure and profit of their hearers, but might even increase the interested attendance at many scanty medical meetings.

MASSACHUSETTS MILK LEGISLATION.

IN furtherance of the long-continued effort for legislative control of the milk supply and its purity in this Commonwealth, another bill has been introduced before the present session of the Massachusetts General Court upon petition of Dr. Allan J. McLaughlin, State Health Commissioner. This bill, whose complete text with comment we may publish in a later issue of the JOURNAL, aims to prohibit the sale or delivery of milk in any city or town without a permit from the local board of health, to be issued after an inspection of the place and circumstances under which the milk is produced and handled. Any such permit may contain reasonable conditions for the protection of the public health and may be revoked for failure to comply therewith. No charge is to be made for this permit. On February 1 this bill was referred by the Senate to the joint session of its committees on agriculture and public health. Further editorial comment upon this desirable piece of legislation will be deferred until these committees have rendered their report.

THE JOURNAL OF CUTANEOUS DISEASES.

WITH the publication of the January number of the *Journal of Cutaneous Diseases*, the office of publication has been changed from New York to Boston, the editorial offices being still in New York. Aside from the interest and value of this old and respected publication becoming more closely connected with the medical centre of Boston, it is interesting to remember that the late Dr. James Clarke White was one of the Journal's early editors, and that his son, Dr. Charles J. White of Boston, is now president of the American Dermatological Association, of which this Journal is the official organ. We trust this change in method may prove to be another step in advance in making this Journal still more useful and commendable, and a praiseworthy expression, not only of the American Dermatological Association, but of the interests and progress of the particular branch of medicine which it serves.

MEDICAL NOTES.

TYPHUS FEVER IN MEXICO.—The weekly report of the United States Public Health Service for January 21, 1916, states that typhus fever is prevalent at Queretaro, Mexico, where, on January 12 the total number of cases was estimated at 500.

PREVALENCE OF MENINGITIS, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for January 21, 1916, states that during the month of December, 1915, there were in Massachusetts 9 cases of cerebrospinal meningitis, 12 of poliomyelitis, and 142 of typhoid fever. During the same period there were also reported 9 cases of meningitis in Maryland, 9 of poliomyelitis in New Jersey, 46 of smallpox in South Carolina, and 272 of typhoid in Maryland.

PHILADELPHIA PNEUMONIA COMMISSION.—As a result of the recent epidemic of pneumonia in Philadelphia, the director of the Department of Health and Charities in that city appointed on January 11 a commission consisting of members eminent as clinicians or in laboratory research, to make an intensive study of the disease. The chairman of this committee is Dr. David Riesman, professor of clinical medicine in the University of Pennsylvania and the Philadelphia Polyclinic. The further personnel of the committee is as follows: Dr. Hobart A. Hare, pro-

fessor of therapeutics at Jefferson Medical College; Dr. Judson Daland, professor of clinical medicine in the Medico-Chirurgical College; Dr. William Egbert Robertson, professor of the practice of medicine, Temple University; Dr. Randle C. Rosenberger, professor of hygiene and bacteriology in the Jefferson Medical College and the Women's Medical College; Dr. Paul A. Lewis, director of the Ayer Clinical Laboratory of the Pennsylvania Hospital and director of the pathological department of the Henry Phipps Institute; and Dr. John A. Kolmer, professor of pathology, Philadelphia Polyclinic, and instructor of experimental pathology at the University of Pennsylvania.

DANGERS OF TOY WHISTLES.—In the weekly bulletin of the New York Department of Health for February 5 is a report of a bacteriological examination recently made of toy whistles offered for sale by the street peddlers.

"It is really surprising to see how thoughtlessly many parents purchase toy whistles from street peddlers who put them to their mouths for purposes of demonstration. That this disgusting habit is likely to spread disease goes without saying. Some time ago, a bacteriological examination was made of twelve whistles purchased from push carts. Five of the whistles had metal and seven wooden mouth pieces. The average number of bacterial colonies developing from the wooden whistles was 99; from the metal whistles, 45.

"A large variety of microorganisms was found. In nine instances streptococci were isolated, two of them of the hemolyzing variety. These streptococci were tested on mice to determine their virulence. Eight of the nine mice died, five within twenty-four hours, two within the next twenty-four hours, and one four days after inoculation. Comment on these findings is unnecessary."

REPORT OF FRESH AIR HOME AT DUMONT, NEW JERSEY.—June 1, 1915, marked the opening of the Fresh Air Home at Dumont, New Jersey, the object of which was to furnish summer vacations to children of tuberculous families living in crowded tenement districts.

From June 1 to September 15, 74 children, boys and girls ranging from five to fourteen years, were cared for, each for a period of two weeks, and in every instance the children showed the results of good food and living under proper hygienic conditions for two weeks. They were taught the rudiments of personal hygiene, supplied with individual toilet articles and with clothing, thereby eliminating any expense to the families. A system of weighing all children on arrival and discharge was maintained and showed a marked increase in weight and general improvement.

The undertaking constitutes a much needed acquisition to the social service work connected with the Yorkville Tuberculosis Clinic.

PYORRHEA ALVEOLARIS.—Some time ago the U. S. Public Health Service instituted an investigation of the curative effects of ipecac and emetin. The work has now been under way for about nine months and is still being pursued. In a recent number of Public Health Reports there is published a preliminary report on the results thus far obtained. According to this, of 190 cases examined, 187 showed the endameba; and of the 187, 78 were treated for pyorrhea. None of the 78 treated lost their endamebae permanently. The condition of the gums and teeth was greatly improved in 22 cases, while 41 cases remained the same; the results were doubtful in 2 cases and 1 case became worse. Practically all that were found negative for endamebae at the conclusion of the injections were found positive for endamebae from two weeks to four months later, in spite of using a solution of ipecac as a mouth wash.

The report concludes as follows: "Emetin is an amebicide, but alone will not cure pyorrhea alveolaris." Less confidence will hereafter be placed in the properties of emetin or other preparations of ipecac, although it is not denied that the drug possesses amebicidal properties. It appears necessary to revert to a degree at least to those painstaking and tedious operative procedures, the efficacy of which has long been known to dental surgeons. Just how much assistance is to be expected from the ipecac preparations used in conjunction with operative measures is a question upon which further studies may be expected to throw some light."

PROHIBITION IN RUSSIA.—The Pirogoff Society, the leading medical society of Russia, has published a report concerning the prohibition of alcohol in that country. They state that the cessation of the drink traffic has contributed to a diminution of sickness (especially venereal and mental), accidents (especially railway), fires, suicides, crimes; and to an increase of industry and material wealth. To the question, shall vodka be eliminated but the return of beer allowed, they answer that the "use of wine and beer cannot be a remedy for alcoholism, because they lead to alcoholism. Beer and wine, on the contrary, are dangerous, because, being weaker and pleasanter to the taste, they attract women and children." Other measures to supplement prohibition are urged, better social conditions and a broadly based propaganda, for the people are filled with ignorance and stupid prejudice regarding alcohol. A survey made in Russia, Province of Penza, showed that only 14% of former drinkers had used substitutes, and most of these were comparatively harmless drinks.

NEW YORK ASSOCIATION FOR IMPROVING THE CONDITION OF THE POOR.—The seventy-second annual report of the New York Association for Improving the Condition of the Poor states that for the first time in its history, during the year

ending September 30, its expenditures exceeded three-quarters of a million dollars, \$180,000. The growth of the Association in the last twenty-five years may be judged by the statement that the gross expenditures for the year 1890 were \$30,278. The scope of work of the Association may be judged from the following figures: 12,000 poor families were assisted with money, food, clothing, rent, friendly help or nursing service; 33,170 days of country care were given to 1,990 convalescent persons; 42,228 days of fresh air outings were given to 17,860 mothers and children; 71,462 days of care and treatment were given to 330 persons; 426 widows were enabled to care well for the 1,363 young children by regular pensions amounting to \$105,418; 439 deserted wives, with 1,474 little children received assistance and \$917 a month was secured for them from deserting husbands; 1,968 men and women were placed in permanent or part-time positions; 16,016 bundles of clothes were washed for families in tenement homes at cost at the new wet wash laundry; 116,734 portions of hot food were sold at a very low price at the newly opened People's Kitchen, to be taken to home or factory or eaten on the premises; 1,488,527 penny portions of hot lunches were sold in 19 public schools.

REPORT OF THE PHILADELPHIA CANCER COMMISSION.—At the general meeting of the Medical Society of the State of Pennsylvania last fall, Dr. Jonathan M. Wainwright, as chairman of the commission on cancer appointed by that Society, presented a report of its work which is published in full in the issue of the *Pennsylvania Medical Journal* for November, 1915. At its outset this report speaks as follows of the nature of the cancer problem and of the part taken by the Society in working towards a solution:

"Inasmuch as the year just passed has covered the period of the greatest activity of the state society as far as its cancer work has gone, it may be of interest to review briefly the work the society has done up to the present time and its relation to similar work by other organizations.

"The state society began its cancer work in 1909, a time at which, at its meeting in Philadelphia, an entire session of the surgical section was devoted to the study of cancer. As the result of this meeting the state society determined to make a strong effort to reduce unnecessary cancer mortality, placing the matter in the hands of a committee, which, with a few changes in membership, has continued up to the present time.

"We believe that the Medical Society of the State of Pennsylvania was the first organization of any kind in this country to make any systematic effort to attack this very important problem. That the problem is really an important one can probably best be seen by reports

of the State Department of Health. Figures from this department are as follows: Total deaths from cancer in 1906 were 4208; in 1907, 4420; in 1908, 4520; in 1909, 4845; in 1910, 5100; in 1911, 5197. This is an increase of 23.5 per cent. in five years. These figures include the natural increase due to increase of population. But the death rate is increasing faster than the population, as shown by the fact that during this same period the deaths per 100,000 living, increased from 60.7 in 1906 to 66.4 in 1911, an increase of nearly 10 per cent. in the actual death rate in five years."

The report continues to speak of further plans of the Society and refers to the part taken by this JOURNAL in the publication of its cancer number on July 15, 1915.

OBERLIN COLLEGE HOSPITAL.—Report from Oberlin, Ohio, on January 31 announces that the sum of \$100,000 has been provided by bequest of the late Dr. Dudley P. Allen of New York for the use of Oberlin College.

"Of this amount, \$50,000 is to be used, under the direction of the board of trustees of Oberlin College, towards the construction and equipment of a hospital building to be known as the Allen Memorial Hospital for use of the community—that is, the inhabitants of the village of Oberlin, and of the college and its students."

"The remaining \$50,000 is for an endowment fund to be known as 'The Dudley P. Allen Fund,' the income of which is to be used, so far as may be necessary, for the Jennie Allen Nurse Fund of Oberlin College, and the balance of the income, if any, is to be used for collegiate hospital services."

SURVEY OF CHILDREN'S HOMES.—The New York Department of Health has just completed a survey of homes for children located in the City of New York. It included a careful inspection of the plumbing, heating, lighting and ventilation of the institution, cleanliness of the premises and of the inmates, a study of the diet, methods of cooking, character of clothing, care of the sick, etc.

There are 84 institutions of this class within the five boroughs of the city. As a result of the survey, 1443 recommendations were made by the inspectors of the Bureau of Child Hygiene of this department, and of these 654 were promptly complied with. The other recommendations were mostly of a structural nature which required time to modify.

So far as the children themselves are concerned, 56% showed some physical defects. The treatment of these defects, as provided by the institution during the past year, was very satisfactory, more than two-thirds of the defects being entirely remedied and there being only five per cent. untreated. Altogether, the conditions disclosed by the survey were most satisfactory

and the institutions all showed great willingness to comply with the recommendations made by the Department of Health.

NEW YORK DEATH RATE.—Despite the warm, spring-like weather prevailing last week, the death rate of New York City continued high. Figures compiled by Registrar Guilfooy showed that during the week just closed, 1812 persons died in the City of New York, as compared with 1760 during the previous week, and 1460 during the week ending Jan. 30, 1915. The death rate for last week was 16.46, as compared with 13.64 for the corresponding week of last year. The acute, infectious diseases caused fewer deaths last week than during the corresponding week of last year. The deaths from influenza, bronchitis, pneumonia, heart disease and Bright's disease were considerably higher. Four hundred thirty-five persons died of influenza, bronchitis and pneumonia during the past week, while only 261 deaths were reported from these causes during the corresponding week of 1915. As has been the case during the past several weeks, the highest mortality occurred amongst the adults of the population, the death rate of children under one year and under five years being lower than during the corresponding week of 1915. The difference of 2.82 in the weekly rate is equivalent to an increase of 310 deaths. The death rate for the first five weeks of 1916 is 16.47, as compared with 14.64 for the corresponding period of 1915.

EUROPEAN WAR NOTES.

WAR RELIEF FUNDS.—On February 5, the totals of the principal New England relief funds for the European War reached the following amounts:

Red Cross Fund	\$144,311.37
Belgian Fund	94,049.11
Serbian Fund	77,208.60
Allied Fund	54,663.80
French Wounded Fund ..	44,891.21
Armenian Fund	31,087.60
French Orphanage Fund ..	23,715.75
Surgical Dressings Fund ..	18,722.00
Polish Fund	18,547.56
La Fayette Fund	17,693.99
French Refugees' Fund ...	6,905.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending February 5, there were 278 deaths reported, with a rate of 19.06 per 1000 population as compared with 244 and a rate of 17.00 for the corresponding week of last year.

There were 11 deaths from influenza. Deaths from pneumonia and broncho-pneumonia numbered 54 against 40 last year.

There were 47 deaths under 1 year as compared with 35 last year, and 100 deaths over 60 years of age against 87 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 77; scarlet fever, 69; measles, 82; whooping cough, 31; typhoid fever, 2, and pulmonary tuberculosis, 65.

Included in the above were the following cases of non-residents: Diphtheria, 9; scarlet fever, 12, and tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 4; tuberculosis, 25, and whooping cough, 1. Included in which were the following non-residents: Diphtheria, 2, and tuberculosis, 3.

MASSACHUSETTS VITAL STATISTICS.—Report issued on January 27 by the Massachusetts Secretary of State shows that during the year 1914 the death rate in this Commonwealth decreased while the birth, marriage and divorce rates increased.

There were 93,399 births in 1914, an increase of 1715 over 1913; the marriages totalled 32,588, an increase of 1185 over 1913, and the deaths numbered 59,234, a decrease of 240.

The number of divorces granted was 2987, an increase of 332.

INSTRUCTIVE DISTRICT NURSING ASSOCIATION.

—A special meeting of the Boston Instructive District Nursing Association was held in this city on January 26. At the morning session papers were read on the relations of visiting nurse associations to their communities. At the afternoon session the secretary reported the existence of 102 nursing associations in Massachusetts, and, in behalf of a special committee, reported a recommendation for the establishment of a Massachusetts Committee for Directors of Visiting Nurse Associations. Reports were also read by the presidents of the several county committees on district nursing.

HOSPITAL BEQUESTS.—The will of the late Mrs. Charles Ingraham French, which was filed on January 27 in the Norfolk County Probate Court at Dedham, Mass., contains a bequest of \$5,000 to the New England Hospital for Women and Children to establish a free bed in memory of the late Dr. Marion Newt.

SOUTH SHORE HOSPITAL MEETING.—On Monday of this week, February 7, a medical meeting was held at the South Shore Hospital, Marshfield Hills, Mass., at which Dr. Farrar Cobb of Boston, delivered an address on "Cancer of the Uterus."

MASSACHUSETTS HOMEOPATHIC HOSPITAL.—At the annual meeting of the Massachusetts Homeopathic Hospital Corporation, held in Boston on January 26, was presented the forty-

sixth annual report of the institution, in which particular emphasis was laid on the opening of the Jennie M. Robinson Memorial Maternity Building, dedicated on January 1, 1916, and containing seventy-six beds.

"In consequence of the large number of additional nurses and employees required, the trustees have found it necessary to purchase the adjoining Hotel Newton and adapt a part of it for thirty maternity nurses. The trustees also contemplate the erection this year of a new service building to accommodate dining rooms, kitchens and laundry, now greatly crowded and overburdened, together with all machinery now in the main hospital; and they have purchased other property in the vicinity, intending to adapt it for the occupancy of other employees.

"The hospital in 1915 cared for 9,074 patients in its wards, besides 274 patients in its convalescent homes, nearly 53% of its work being for free patients; and the steady and rapid growth of the work testifies to the regard in which it is held. Its out-patient department shows a similar growth and with new quarters and the most modern equipment, a considerable advance is expected. The hospital has great need of other buildings and an increase of its endowment funds to care for its annual deficit."

CAUSES OF INFANT MORTALITY.—On January 28, Dr. John Lovett Morse of this city, delivered an address on infant mortality before the Boston Milk and Baby Hygiene Association. In this address he is reported as having spoken as follows of the causes of infant mortality and of the means for its prevention:

"Prematurity, congenital debility, congenital defects and accidents account for 25% of our infant mortality, diseases of nutrition and gastro-intestinal disorders for 40%, acute respiratory diseases for 20%, acute infectious diseases like scarlet fever for three per cent., tuberculosis for two per cent., and all other causes for 10%.

"The diseases of nutrition and the gastro-intestinal diseases are due to bad feeding. About 85% of all infantile deaths are due to bottle feeding, and 90% of the deaths from diarrheal diseases are of bottle-fed infants. In one year one in five of the bottle-fed died, and only one in 30 of the breast-fed died.

"To lower the mortality from the diseases of nutrition and the gastro-intestinal diseases you must increase the number of babies who are breast-fed. Why do not poor women nurse their babies? They do not appreciate the importance of breast-feeding; they are tempted to use proprietary foods, or they have to go out to work.

"The remedy is to provide a kind of work which will permit them to care properly for their babies, or to provide food for the mother so that she can stay at home and nurse her baby. Bottle-fed babies die because of the ignorance of the mothers as to how their babies should be fed,

and also because of the failure of doctors to tell them.

"Another reason is that such mothers cannot get good milk, and, even if they do, are unable to take proper care of it. There is thus need for education of the doctors, education of the mothers, and improvement of the milk supply."

At another meeting in Boston last week, Miss Ruth True, an agent of the Children's Bureau of the United States Department of Labor, described the organization of that Bureau in April, 1912, and reported some of its recent investigations into the social and economic causes of infant mortality. The latest statistics show that during the 10 years between the last census and the one preceding, 2,500,000 babies under one year of age died in this country. In a West Virginia steel-making and coal-mining town, the death rate was 134 out of every 1000 babies born, as against 84 in 1000 in a residential town in New Jersey. In New Zealand the infant death rate under one year is only 38 per thousand, the lowest in the world.

TWENTY-FIFTH ANNIVERSARY OF SHARON SANATORIUM.—The ninth day of February marks the twenty-fifth year of the establishment of the Sharon Sanatorium. When the Sanatorium was first opened it was a pioneer in the field of treating pulmonary tuberculosis in the open air of bleak New England. The ever-increasing number of state and private sanatoria throughout the United States for the prevention of pulmonary tuberculosis, regardless of the special climate in which they may be situated, would seem to be sufficient proof that the success of the work at Sharon has been, indirectly at least, instrumental in the marvellous development of the same idea in the last decade. As a fitting landmark in the progress of the work, the directors, at this coming twenty-fifth anniversary are desirous of establishing a small department for the treatment of children who are showing symptoms of tubercular disease. To carry out this plan of erecting a building and of maintaining it, generous gifts of money will be needed, since the income from the price of board will be far below the necessary expenditure. The present board of directors is made up as follows:

William T. Sedgwick, Se.D., president; N. H. Stone, treasurer, 614 Sears Building, Boston; Mrs. Charles A. Porter, secretary; Edmund F. Merriam, D.D.; Mrs. Henry P. King, Mrs. William T. Sedgwick, Vincent Y. Bowditch, M.D.; L. Vernon Briggs, M.D.; Jeremiah Smith, Jr., Ernest B. Dane, Walter C. Bailey, M.D.

BOSTON LYING-IN HOSPITAL.—The annual meeting of the Boston Lying-in Hospital was held in this city on January 26 and the same trustees and officers were reelected for the ensuing year. The reports submitted at this meeting show among other items the following points of interest:

"Number of cases cared for in the Hospital shows an increase of about 17%, including more free cases. Maternal and infant mortality, and still births, are materially reduced. The work of the Pregnancy Clinic shows an increase of more than 1,000 visits over the year 1914, and more than 2,000 visits over the year 1913. A branch of the Clinic has been opened in connection with the South End branch of the Out-patient Department, so that the Clinic is now organized to furnish medical care and supervision, prior to confinement, to each of the nearly three thousand cases a year the Hospital and Out-patient Department now take care of. The number of patients in the Hospital was 922, and the number in the out-patient department was 1932. The number of new cases treated in the Pregnancy Clinic was 1820. The average number of patients in the Hospital was 41.8.

"The resignation of the visiting physician, Dr. Charles M. Green, was recorded with expressions of deep appreciation for his years of devoted service. Dr. Robert C. Cochrane and Dr. Delbert L. Jackson have been added to the medical staff as assistant physicians to out-patients.

"Plans for a new hospital building on the land already purchased for the purpose, opposite the Harvard Medical School, at the corner of Longwood Avenue and Avenue Louis Pasteur, are being pushed to completion as rapidly as possible, and the campaign for the necessary funds for the building is being energetically pursued. About a quarter of the amount necessary for the buildings is in hand or pledged, largely as a result of the active work of the past month of the committee in charge. It is hoped that a generous public will provide the balance in time to make it possible to commence work the coming spring."

Obituary.

GEORGE HOWARD MALCOLM ROWE, M.D.

DR. GEORGE HOWARD MALCOLM ROWE, superintendent and resident physician at the Boston City Hospital from 1879 to 1908, died at his home, 11 Ivy street, Boston, January 30, 1916. Dr. Rowe was born at Lowell, Mass., February 1, 1841, and was educated at Berwick Academy and Phillips Exeter Academy and at Dartmouth College, receiving the degree of A.B. from Dartmouth in 1864, and an A.M. in 1867. He graduated from the Harvard Medical School in 1869, and following that held these positions: Assistant physician at the Pennsylvania Hospital for the Insane; assistant physician, Hartford Retreat; assistant physician and superintendent, Boston Lunatic Hospital.

In 1879, Dr. Rowe was appointed superintendent and resident physician of the Boston

City Hospital and during the thirty years in which he occupied this position he became a recognized national authority on hospital administration. "His scientific interest in medical advancement, his sagacious forecast of municipal needs and his liberal policy in administration made his work a controlling factor in developing the institution into one occupying a foremost place in size, scope and equipment. Dr. Rowe was deeply interested in raising the training school for nurses to the highest standard of efficiency. He was a close student of sanitation and its relation to public health and was especially conversant with hospital construction and contributed much to the literature on these subjects. During his administration he initiated, developed and completed many new additions and alterations in the equipment of the Boston City Hospital, among which may be enumerated the South Department, the Burnham Memorial Building, the Haymarket and East Boston Relief Stations, the Nurses' Home, the Pathological Building, the new surgical out-patient building, the new amphitheatre, the convalescent home, the x-ray department, the power house, and the ambulance service. Upon his resignation at the close of his service the trustees of the hospital in their public acknowledgment to him said:

"After 30 years of faithful, continuous service you have the consciousness of having achieved that high standard of efficiency which places you in the front ranks of hospital superintendents in this country."

In 1911 he was placed on the retired list of Fellows of the Massachusetts Medical Society, having been a Councilor from 1895 to 1909. He was a Fellow of the American Medical Association, a member of the American Health Association, the Boston Society for Medical Improvement, and was at one time president of the Association of Hospital Superintendents of the United States and Canada. Dr. Rowe was never married.

Miscellany.

MEMORIAL RESOLUTIONS FOR DR. CHEEVER.

THE following resolutions were adopted at a meeting of the Board of Trustees of the Boston City Hospital:—

"It is with a keen sense of personal loss as well as profound sorrow, that we learn of the death of our friend, Dr. David Williams Cheever, surgeon emeritus of the Boston City Hospital.

"The close of a long and useful life has come and the last of the original staff of the hospital has passed to his rest. For more than half a century he was a leader in the medical profes-

sion. He kept in touch with the growth of the hospital from its opening, when he was first appointed surgeon, up to the present time, and was the prime factor in giving it distinction in its surgical work. During his long career he was foremost in the ranks of those who have made wonderful advancement in surgery and many of his writings are deemed an authority and of permanent value in this field of work.

"A wise counsellor, a public spirited citizen, a beloved physician, eminent in his profession, a lover of humanity, happy in doing good, the world has been benefited by his being in it, and he will be greatly missed by all who have had the pleasure of a close relationship with him, and who have profited by his judgment and advice.

"To his beloved wife, who has traveled life's journey with him for so many years, we tender our heartfelt sympathy. We feel that she will derive great comfort and consolation from the memory of their long and happy life together, and of the great good he has done in the world by alleviating the suffering of the sick and afflicted. His devotion to her and his love for his children will ever be uppermost in her mind and will help to heal the wound his death has made.

"To his children we extend our condolence on the loss of a loving father, whose example is worthy of their emulation.

"A copy of this expression of our deep regret at the loss of Dr. Cheever we will forward to his bereaved family and will place it upon our records that it may be read by all who come after us.

(Signed)

"A. SHUMAN,
"THOMAS A. FORSYTH,
"CONRAD J. RUETER,
"FRANCIS J. KEANY, M.D.,
"JOSEPH P. MANNING,

"*Trustees of the Boston City Hospital.*"



IMPROVING CANCER STATISTICS IN THE UNITED STATES.

At the suggestion of a number of the foremost American students of the cancer problem, the United States Bureau of the Census has instituted radical improvements in the collection and publication of the statistics of this disease. A special report on deaths from cancer in the United States during the year 1914 is in preparation and will be issued shortly after the first of the year. Inquiries recently received by the Director of the Census have indicated that some misapprehension has arisen in regard to the purpose and scope of this study, the American Society for the Control of Cancer has issued a statement explaining the significance and essential features of this project of the Census Bu-

reau, which is thought not only to promise important additions to our knowledge of cancer but to constitute a noteworthy advance in the registration of American vital statistics.

It should first be made clear that the Census Bureau has not undertaken special research work that will in any way duplicate the studies of existing institutions and laboratories which are investigating the cause of cancer. On the other hand, there should result a marked improvement of our national mortality statistics of this disease in the direction of greater accuracy and more detail. The experience of foreign countries has shown the value of perfecting and carefully analyzing the annual statistics of deaths in order to throw new light upon the cancer problem, which still remains the chief outstanding question in the realm of medical science.

In February, 1914, the American Society for the Control of Cancer suggested to the Federal authorities that the figures of deaths from cancer in the United States Registration Area be published in greater detail, and that instead of being reported under only seven headings, as had been the custom hitherto, they be listed under many more titles according to the part of the body first affected, thus affording opportunity for more exact comparative study. The suggestion received favorable consideration by the Bureau of the Census, and a special report for 1914 was ordered begun by the former director, Hon. William J. Harris, and is now nearing completion under his successor, Hon. Sam. L. Rogers. This special monograph on cancer will consist of tables showing the deaths from cancer, according to the site of the disease, age, sex, color, nativity and marital condition, for the registration area, the several registration states and the usual subdivisions. Figures for white and colored will be shown separately for such counties and towns as have a colored population of 10,000, or at least 10% of the total. The new plan subdivides the seven titles for cancer in the International List of the Causes of Death into twenty-nine headings referring to the exact site of the disease. For instance, all deaths from 'cancer and other malignant tumors of the buccal cavity' will now be reported under the separate subdivisions for cancer of the lip, tongue, mouth and jaw, and similarly with the other groups.

Upon the further suggestion of a prominent surgeon the Census Bureau also planned to increase the accuracy of the statistics by tabulating separately the returns in which the diagnosis was "reasonably certain" and those in which it was "uncertain." In arriving at this distinction a report is classed as "certain" if the diagnosis was confirmed by microscopical examination of tissues, or by surgical operation, or by autopsy. All cases of internal cancer in which the diagnosis was based on clinical observations alone are classified as "uncertain" regardless of any strength of assertion by the

physician that the diagnosis was correct. At the request of the Census Bureau an advisory conference, including representatives of the Harvard Cancer Commission, the George Crocker Special Research Fund of Columbia University, the Barnard Free Skin and Cancer Hospital of St. Louis, the New York State Institute for the Study of Malignant Disease, the Prudential and Metropolitan Life Insurance Companies, the American Association for Cancer Research and the American Society for the Control of Cancer, considered the details of the plan and assisted in the formulation of instructions for editing certificates of deaths from cancer in preparation for the special report. To gather the necessary detailed information the Director of the Census has sent over 35,000 letters of inquiry to physicians who certified deaths from cancer during 1914.

Although a large amount of additional labor has been thrown upon the Division of Vital Statistics of the Census Office by the preparation of this report, it is believed that the trouble and expense will be more than repaid by the result. The improvement of cancer statistics has practical bearings of greater consequence than may at first appear. Indeed, the importance of statistical investigation in arriving at the solution of the cancer problem is likely to be overlooked. Much of the valuable knowledge of the disease which we possess today has resulted from the collection and comparison of statistical data, and this method must be relied upon, side by side with experimental research and clinical observation, to elucidate the baffling problem of the nature and cause of this disease. The publication of this report by the Census Bureau should bring out new and useful information as to the prevalence of the disease in the United States and thereby contribute to the better understanding of its controllable features. Such a study as the Census Bureau is making, if continued, should also throw clearer light on the question of whether or not cancer is really increasing. The foremost authorities have repeatedly urged that this question can be scientifically answered only by studying separately the facts in regard to each of the many forms and sites of malignant disease. The British Imperial Cancer Research Fund has coöperated with the Registrar-General of England and Wales in a thorough analysis of the detailed figures for cancer of the stomach, cancer of the tongue, cancer of the breast, etc., for successive years. By the progressive action of the Director of the Census similar data, as to parts of the body affected on which such studies can be made will now become available for the first time in the official statistics of the United States.

The new plan will not only produce data for the year 1914, but every future year a vast amount of information will be recorded and stored away, and can be compiled and published when the demand warrants. Efforts are also being made further to coördinate the work of

the state and federal statistical offices for the better registration of deaths from cancer and other diseases as well. By the operation of this plan, and the mutually supplementary efforts of the national and state registration officials, it will be possible permanently to record and study the extensive American data on cancer mortality, with all the detail required by the most exacting statistical methods.

UNITED STATES DEATH RATES IN 1914.

REPORT from Washington on December 20, states that the director of the Bureau of the Census, United States Department of Commerce, has recently issued the following preliminary statement of the death rates in the registration area of the United States in 1914. This statement shows for this area a death rate of 13.6 per one thousand of estimated population, the lowest rate hitherto recorded in this country.

"Unfortunately the mortality statistics do not cover the entire United States, since not all communities have adequate death-registration systems. Those states and cities in which the registration of deaths is approximately complete constitute what is known as the registration area. This area comprises 25 states (in one of which, North Carolina, registration is restricted to municipalities which had 1000 population or over in 1900), the District of Columbia, and 32 cities in non-registration states, and contained two-thirds (66.8%) of the total estimated population of the United States in 1914. This represents a very gratifying increase as compared with 1900, when the registration area contained only about two-fifths (40.5%) of the total population of the country. Figures for Kansas are included for the first time in the statistics for 1914.

"There is a widespread and increasing interest throughout the country, especially in the South, in respect to vital statistics. The 'model law' for the registration of births and deaths was put into operation in South Carolina on January 1, 1915, and during the present year this law was enacted in the states of Florida and Illinois. The Bureau of the Census is actively coöperating with officials in other states in order that the entire country may be included at the earliest possible date in the registration area for deaths.

"The total number of deaths recorded in the registration area in 1914 was 898,059, corresponding to a death rate of 13.6 per 1000 population. This rate is the lowest on record, the most favorable year prior to 1914 having been 1912, for which the rate was 13.9.

"The death rate for 1914 is 16% lower than the average for the 5-year period 1901-1905. When due allowance is made for the addition of

many new states to the registration area between 1905 and 1914, and the comparison is confined to the registration states as they existed during the period 1901-1905, there still is shown a decided decrease, amounting to 9.4%. In other words, in a typical community in the registration area there were only 10 deaths in 1914 where there were 11 a decade earlier. In the original registration states as they existed in 1901-1905, the population of which is about one-fourth of the total for the United States, the reduction in the rate is equivalent to a saving of about 38,500 lives in 1914. On the assumption that a corresponding reduction in the rate had taken place throughout the entire country, the saving would amount to about 150,000 lives in 1914 for the United States as a whole. This furnishes a statistical measure of the contribution made to civilization by medical science and improved sanitation.

"Among the states for which death rates for 1901-1905 are given, the greatest proportional decrease between that period and 1914 is shown for Rhode Island—17.4%. Next in order are New York, with a decrease of 14%; New Jersey, 11.8%; Massachusetts, 11.4%; Vermont, 7.4%; Connecticut, 3.8%; Indiana, 2.3%; Maine, 1.9%; New Hampshire, 1.8%. Michigan alone showed a slight increase—eight-tenths of 1%.

"Among the cities of 100,000 or over the tendency is toward a still greater reduction in mortality. The following cities show a decrease of 20% or more from the 5-year period 1901-1905 to 1914: Jersey City, 28.5%; New York City, 25.8%; San Francisco, 23.6%; Denver, 23.3%; Newark, N. J., 22.5%; Pittsburgh, 21.9%; Atlanta, 21.8%; Los Angeles, 21.3%; Lowell, Mass., 21.3%; and Paterson, N. J., 20.1%.

"It should be remembered that the rates here given are 'crude' rates, which make no allowance for differences in the sex and age distribution of the population, and that inferences in regard to the relative healthfulness of different states should not, therefore, be drawn without more thorough investigation."

BENEFIT OF PHYSICAL EXAMINATIONS.

THE following letter from a Massachusetts physician on the benefit of physical examinations as suggested by the National Association for the Study and Prevention of Tuberculosis, appeared in the issue of the *Greenfield Gazette and Courier* for December 18, 1915. As a statement of the purpose and value of these examinations for the laity from the standpoint of the profession this letter seems to deserve republication here in full.

"Can I remind your readers in this way that a week was appointed by the National Association for the Study and Prevention of Tubercu-

losis for each individual to have a general physical examination, and they hope to persuade the majority of persons to make such an examination an annual habit. Your space is too valuable to warrant my taking much of it to give the many reasons why this undertaking should be given serious consideration by every thinking person who has others dependent upon him, and again being a physician, my motives might be questioned, but at the risk of the latter, I offer the following:

"1. Every aggressive business man recognizes the value of a good bookkeeping system, and the need of an annual inventory of his stock. If he does not utilize these aids, he is guessing at his financial condition, and guesswork is disastrous in the complicated business methods of today. If such annual stock taking is good to maintain one's financial condition, how much more important is a working knowledge of our bodily functions? Ignorance of finances means simply a money loss. Ignorance of one's physical condition is often fatal to our maintaining life itself.

"2. The almost universal use of the automobile has brought home to thousands as never before the need of regular inspection of machinery to get and maintain efficient action, and yet there is not a part of the automobile mechanism which is called upon for the sustained work comparable to several of the bodily functions—the heart, lungs and kidneys, for example. When the aeroplane motor was first used, its sudden stopping in mid air was almost invariably fatal to the occupant, but later experience and confidence developed a gliding function, and motor faults are now met in that way; but let the heart stop beating for a full minute and exceedingly serious results soon follow.

"3. It is the common belief that we need not think of illness or death until we are over 60 years of age, and yet reliable figures demonstrate that almost every one who has reached the age of 30 has something the matter with his body which is limiting its efficiency. These defects range all the way from a decayed tooth to unsuspected heart disease. A recent examination of 2000 men and women showed that 70% had more or less serious impairment, while not one of the remaining 30% could be given a clean bill of health. If you are a farmer, you know what it costs in good money to replace a piece of machinery that has not been regularly overhauled and properly housed; if you are a mechanic, you know how difficult it is to do satisfactory work with dull tools; if you are a business man, your ignorance of leaks does not make you a more formidable competitor; if you are a woman, your lack of knowledge of your bodily condition won't check the development of one of the many diseases which you are liable to contract.

"4. You may make up your mind to have a physical examination and ask what information you should require from the examiner. A skill-

ful examiner can in a brief time get your height, weight and body measurements and make intelligent inquiries regarding the working of your special senses and inspect the organs of mastication. He will see if there are evidences of rupture, varicose veins, flat foot, faulty posture, spinal curvature or other deformities, and it wouldn't take long to make a few classical tests to determine the possibility of nervous diseases of the brain or spinal cord, such as paresis or locomotor ataxia. Then he will want to know the working conditions of those organs that receive, digest and assimilate those substances which you take into the body to act as fuel or for its growth, stomach, intestines, liver, etc. Next may come the conditions of those organs whose function it is to remove the waste products of the food, such as kidneys, skin and bladder. Then he will inquire about and test the functions of those important organs which make the blood and distribute the latter to every part of the body—heart, lungs, blood vessels, etc. Finally, there is the condition of the reproductive organs to be ascertained, which cannot be ignored if you discharge your obligation to the race.

"5. The cost of such an examination as above outlined will probably not exceed \$5. If it is thoroughly done, it will take the time, skill and judgment of a competent physician, and he will be obliged to use a few expensive instruments of precision. Five dollars will not buy an attractive looking hat for a woman or a serviceable coat for a man, and if you have ever had an automobile overhauled, you know what a sorry figure a \$5 bill would make in settlement, and yet that sum invested in a physical examination annually, will pay a big dividend to your 'peace of mind' if you are sound, or be the means of starting an intelligent combat with disease if you are physically impaired.

"These remarks may not arouse you to action or appeal to your judgment, but of one thing we are all agreed, that is, disease is the most democratic of evils, attacking the poor and the rich with the utmost impartiality.

"Yours truly,

"BENJAMIN P. CROFT, M.D.

"Greenfield, Mass., Dec. 8, 1915."

Correspondence.

SURGEON OF THE "MAYFLOWER."

310 COMMONWEALTH AVENUE.

Boston, Feb. 1, 1916.

Mr. Editor: In view of the plans now under consideration for the observance of the tercentenary anniversary of the landing of the Pilgrims, the present time seems opportune for the presentation of the claims of the medical profession for recognition of the services rendered by the pioneer physician of this country, Dr. Samuel Fuller. He was a surgeon on board the *Mayflower* and one of the signers of the memorable Compact of November 11, 1620. For many years he was the only physician among the colonists. Prior to the sailing of the *Mayflower*, Dr. Fuller was

an influential and important factor among that Scrooby group of Separatists, including Bradford, Brewster, Allerton, Winslow, Standish and others who settled at Leyden in 1609. He was a highly trained physician and was a contemporary of Harvey, then giving to the world the great discovery of the circulation of the blood.

Dr. Fuller's services were not confined to the Pilgrims at Plymouth; he was frequently called to the Puritan settlements, and it was from these visits to the Puritans that a most important turn in the affairs of the colony resulted. It will be recalled that the distrust and hostility of the Puritans, both at Salem and in England, had reached a point when further financial aid to the Pilgrim settlement at Plymouth was to be denied. The missions to England of Winslow, Allerton and Standish, seeking further support and confidence, had failed; the colony seemed destined to follow the fate of the earlier settlement at Jamestown.

At this critical time Governor Endicott requested the professional services of Dr. Fuller for Mrs. Endicott, then ill at Salem. History gives many accounts of the visits of this Pilgrim physician to the Puritan settlement at Salem, and, later, to the settlements at Dorchester and at Boston. All writers agree that the results of these visits were a changed sentiment in England, with an increased confidence in the Plymouth settlement, and an active coöperation at home of men of wealth and position. All this resulted in a greater disposition to emigrate to this country and consequently a rapid and vigorous growth of the colonies which meant the complete success and permanency of the settlements in the new world.

The writings of Bradford, of Endicott, of Winthrop and others all testify that the changed sentiment towards the Pilgrims was due entirely to the professional missions of Dr. Fuller among the Puritans. He remained in the colony and died here, a victim of the small-pox epidemic of 1633. His will was the first one probated in this country and gives many interesting sidelights on the men and doings of that first permanent settlement. The medical profession, especially of Massachusetts, owes it to the memory of this good man, as well as to history, that a suitable recognition of him be requested in any plan adopted for celebrating the anniversary of the landing at Plymouth of Dr. Fuller and his fellow passengers.

Respectfully yours,

THOMAS F. HARRINGTON, M.D.

THE SOURCE OF INFLUENZA.

Boston, Jan. 21, 1916.

Mr. Editor:

Permit me to take exceptions once more to the statements recently made in two editorials upon influenza, and more especially to the latter, because therein you advocate a plan which is plainly against reason and nature. Unless it were possible to isolate for many months the thousands of victims of la grippe and prevent their infecting the atmosphere, not only in the Americas but in all the world, the theory advocated cannot possibly be carried into practice. Besides being decidedly dangerous to civilized peoples, the theory of a "contagion ovium" is essentially untenable. There is one disease which is always contact-borne; perhaps another, very rare in a civilized community, leprosy. This disease, although known to be spread by a bacillus, is recognized as an infection, primarily of the rhinopharynx in some quarters.

Influenza is an air-borne infectious disease. It is not epidemic (upon the people) in any city or town until it has been carried thither from some other city or inhabited section of the country where it was epidemic and become endemic (in the people).

Without entering more fully into details, I append these few quotations and suggest a fuller study of the

general subject of infectious diseases, with the above 'data' in mind.

"Influenza is independent of hygrometric, thermometric and barometric changes." Greenley, 1890.

"Influenza . . . the micro-organisms are carried high up by the warm currents and are precipitated again to the stratum in which they are effective by the eddies which the cold currents produce."

"Transmission of the disease from person to person is the exception; the dissemination of the disease is accomplished through the atmosphere."
"Combe".

"Caused by minute cryptogamic bodies in the air."
"J. K. Mitchell, 1850."

Very truly yours,

EDMUND D. SPEAR, M.D.

A REMINISCENCE OF DR. WHITE.

Mr. Editor:

When some years ago Dr. White gave before the Medical Improvement Society a paper upon his professional recollections, and again two years ago published his "Sketches", it seemed to me that a point ought to have been emphasized upon which he was modestly silent.

Now that I am the only person, with the exception of President Eliot, who can do this from a personal recollection, his recent death moves me to recall those characteristic qualities as conspicuous at the time of the reforms in the Harvard Medical School, and indeed in American legislation, as when they later became more widely known to generations of scholars and practitioners.

The reforms in medical education were not entirely the work of the Harvard Medical School, although among the very earliest. They would have come and come soon, for they were "in the air" all around us, but from the beginning they had the heartiest sympathy of Dr. White. It was undoubtedly largely due to the strenuous support given by him to his illustrious classmate that they were so steadily pushed through. The faculty, at that time voting by departments, was by no means a unit, and while, on the whole, recognizing that reform was necessary and was coming, there was left a good deal of conservatism and doubt as to the rapidity with which it was best to move, and there was some strong opposition from important and influential sources.

But Dr. White's tenacity of purpose never wavered and the persistent vigor of his attacks upon the old customs everywhere prevalent never failed.

His deserts in his specialty have been justly recognized at home and abroad, but his services to the cause of sound medical education ought not to be overlooked in a journal which has for so many years advocated that cause in this country.

I am very respectfully yours,

ROBERT A. EDES, M.D.

A GRACIOUS ACKNOWLEDGMENT FROM THE FRONT.

22 GENERAL HOSPITAL

B. E. F.

FRANCE, 14 January, 1916.

To the Editor in Chief,

Boston Medical and Surgical Journal,

Dear sir: As the officer commanding the above mentioned hospital, I am writing to request your kind help in the following circumstances. Many of the members of the first unit (Harvard) were so generous as to send to my care a large number of Christmas presents and tobacco, etc., to their old friends here, the second Harvard unit, and to medical officers and nurses, and in the majority of the parcels there was no indication as to the names of the

senders. I am therefore unable to acknowledge personally the receipt of these articles.

I have taken the liberty, therefore, of asking you to be so very kind as to publish in the BOSTON MEDICAL AND SURGICAL JOURNAL a short paragraph expressing the great indebtedness the medical officers and nurses feel towards those gentlemen of the first unit who remembered them so generously, and to thank them most warmly.

I am, dear sir, yours faithfully,

ALLAN PEREY, Lieutenant Colonel.

[NOTE. The JOURNAL is most happy to publish Colonel Perry's letter and to call it to the attention, not only of those to whom it is addressed, but also of all its readers, that they may realize the cordial affiliation between members of our profession in safety at home and in the dangers of service in the field.—EDITOR.]

NOTICES.

CHILDREN'S HOSPITAL.—The Visiting Staff of the Children's Hospital will hold a clinical meeting in the amphitheatre of the Hospital on Friday, February 18, at 4.30 P.M. Subject: Exhibition of pathological specimens. Discussion of abdominal and retroperitoneal tuberculosis. The profession is cordially invited.

VOICE CLINIC, PSYCHOPATHIC HOSPITAL.—The sixth "Authors' Evening" of ten papers on Medical Inspection of Speech Disorders in Public Schools, a speech defect program based on a survey of 20 cities, by Walter B. Swift, M.D., in charge, Voice Clinic, and Catherine A. Osborne, M.D., Ph.D., First Assistant, will be given at the Voice Clinic, Psychopathic Hospital, 74 Fenwood Road, Brookline, Mass., February 11, 1916, at 8 P.M.

Introduction. Summary of the Speech Survey, 1. The Need of Medical Inspection of Speech Defects, 2. Disastrous Features of Ill-Trained or Ignorant Speech-teachers, 3. Cases Illustrating Teachers' Care *Sine* Medical Care, 4. Why No Speech Teacher Should Treat Without Medical Advice, 5. Possible Services of a Medical Director of Speech Disorder, 6. The Offices of the School Speech Inspector, Desk, Clinic, 7. Other Services in Education the Speech Specialist Can Render, 8. What The Speech Director Should Do—Hours, Pay, Service, 9. How Teachers Should Use the Medical Speech Director, 10. New Services Expected of the Director in the Lower Grades.

Physicians and medical students invited. If you expect to attend, send a postal to 110 Bay State Road, Boston.

RECENT DEATHS.

DR. GUY HOLBROOK died at his home, 22 Mt. Vernon Street, Boston, January 16, aged 70 years. He was a graduate of the Albany Medical College in 1866 and had practised medicine in Vermont and New Hampshire, and later in Lowell, Mass., where he was an alderman and a member of the Board of Health.

DR. EDWARD SMITH EVELETH, a retired Fellow of the Massachusetts Medical Society, died at his home in East Gloucester, Mass., January 25, aged 74 years. He was a graduate of Phillips Exeter Academy, and of the College of Physicians and Surgeons, Columbia University, in 1866, joining the Massachusetts Medical Society in that year. He was retired in 1908.

DR. ARAPHEA B. DRAKE, who died in South Boston recently, was born in Lincolnville, Maine, in 1840. She was one of the early women practitioners in this city.

DR. W. ALONZO ELLIS, who died of pneumonia recently in Essex, Mass., was a well known practitioner in that city. He is survived by his widow.

The Boston Medical and Surgical Journal

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Original Articles.

PRELIMINARY NOTES ON SKIN REACTIONS EXCITED BY VARIOUS BACTERIAL PROTEIDS IN CERTAIN VASOMOTOR DISTURBANCES OF THE UPPER AIR PASSAGES.

By J. L. GOODALE, M.D., BOSTON.

IT HAS been shown for some years that an individual sensitized to a given proteid may exhibit a characteristic reaction, if the proteid is brought in a soluble form in sufficient concentration into contact with the mucous membranes, or introduced below the epidermis.

During the past two years 340 cases exhibiting vasomotor disturbances of the upper air passages have been examined, with reference to the possibility of eliciting a skin reaction by the application of various proteids to an abrasion or scratch of the skin. The results of these studies have shown that from a clinical stand-

point we may divide such conditions into two main groups, the seasonal and the perennial. The seasonal group includes hay fever and hay asthma, where the exciting proteid is represented by the pollen of different species of plants, the occurrence of the symptoms being synchronous with the flowering of the plant in question. The perennial forms of vasomotor disturbance occur at any time of the year. Two groups are recognized at the present time, the first arising from the ingestion and the second from the inhalation of the proteid in question. The most typical example of the ingestion form is found in asthma from eggs. The inhalation type is represented most typically by horse asthma, the fine particles of the animal's hair exciting sneezing or asthmatic attacks, when they come into contact with the nasal mucous membrane.

The object of the present communication is to call attention to the probable existence of a third group of vasomotor disturbances, which may be termed infectious, in that their appearance seems to stand in relation to bacterial invasion of the upper air passages.

The individual has more or less constant sneezing, with outpouring of watery discharge,

and shows on examination of the nasal mucous membrane pallor and oedema. Such cases present frequently the picture of chronic sinusitis, with enlargement of the middle turbinates and often with polypoid degeneration of the mucous membrane of the sinuses. These conditions may exist independently or in association with asthma. The individual may go for considerable periods of time with little or no vasomotor disturbance, and yet with the advent of an acute infection of the nasal or bronchial mucous membrane he may exhibit the symptoms of sneezing or of asthma in a marked degree. The mucous membranes in these conditions do not show the reddening and pus formation which are characteristic of acute rhinitis and acute bronchitis, but present rather the typical picture of hay-fever.

From our knowledge of the influence of plant pollen and of the keratin proteid of animals upon the nasal mucous membranes, in sensitized individuals, it would appear possible that these perennial types of vasomotor disturbance may be caused by the sensitization of the individual to bacterial proteids which are liberated and come into contact with the cells of the mucous membrane, giving rise, when in sufficient amount, to anaphylactic manifestations. On this hypothesis such forms of vasomotor rhinitis and asthma, while occasioned primarily by the invasion of the mucous membranes through infecting microorganisms, present clinical manifestations in which inflammatory phenomena occasioned by bacterial toxins are subordinate to, or overlaid by, the anaphylactic phenomena induced by the proteid constituents of the bacterial bodies themselves.

No work as yet has been undertaken, to my knowledge, to determine the existence of this possibility, but if it should be established, such conditions would then immediately take their place in the system of classification as anaphylactic disturbances occasioned by the proteid of the schizomycetes. Following out this line of thought, if we should apply to a scratch on the skin the bacterial proteid in a soluble form to which the individual has been sensitized, we should expect the prompt development of a characteristic skin reaction in the same manner as that which results from plant pollen. Experiments were undertaken by the writer to determine the possible existence of such a phenomenon. Cultures were taken from eight cases of vasomotor rhinitis and of asthma of the apparently infectious type. The micro-organisms found were the staphylococcus *p. aureus* and *albus* and the pneumococcus. Cultures were grown also from laboratory stock of the micrococcus tetragenus, the micrococcus *cereus flavus* and the staphylococcus *pyogenes citreus*. Another organism having some of the characters of Friedländer's bacillus was isolated from a case of severe asthma. The cultures were grown on agar slants, when they were exposed to

ether vapor, the object sought being to kill the micro-organisms without coagulation of their albuminous constituents. After remaining in ether vapor four days, the colonies were transferred to a 12% dilution of alcohol with water, in order to extract, if possible, the proteids of the bacteria. This alcoholic dilution was chosen as it has been found by the writer to preserve best the anaphylactogenic properties of pollen and keratin extracts. The quantity of bacteria was about one-third by volume that of the alcohol dilution added; so that, on centrifuging, the bacterial bodies occupied one-third and the fluid two-thirds of the tubes. After a week the fluids were tested on the skin of patients in the same manner as that employed for the diagnosis of plant sensitizations. Fifty cases of vasomotor rhinitis and of asthma were examined by the application of the staphylococcus *albus*, *aureus* and *citreus*, the micrococcus *tetragenus* and the *cereus flavus* with the following results.

In the cases presently to be described a positive skin reaction was obtained which developed in the following manner. (Immediately after the skin is scratched, a hyperemia frequently occurs which is plainly traumatic in character, appearing equally in the control scratches, and fading in the course of a few minutes.)

The positive skin reaction proceeds to develop in the course of 10 to 15 minutes, and ranges from a narrow band of hyperemia bordering the scratch to a hyperemic area of two centimeters in diameter. In the more marked reactions edema occurs which may attain a transverse diameter of one centimeter. The phenomena resemble those obtained in hay fever cases, from the application of the specific pollen, but show a preponderance of hyperemia in the proportion to the edema excited. Itching was not observed. In this connection it should be said that observations of the skin reaction in hay fever show that itching is found only in those skin disturbances which exceed the ones under consideration. After half an hour the reddening and edema begin to disappear, and usually at the end of an hour no trace of the disturbance is left, beyond the trauma occasioned by the scratch.

Staphylococcus p. albus. This organism was tested on the skin of 41 patients, in 29 of whom no reaction was elicited. Twelve cases gave a positive reaction.

Staphylococcus p. aureus. In 43 cases this organism gave 21 negative and 22 positive reactions.

An organism (serial No. 21) isolated from a severe case of asthma having some of the characteristics of Friedländer's bacillus gave 21 negative and one positive reaction. The patient from whom this was isolated did not give a definite reaction to it.

Staphylococcus p. citreus was tested in 18 cases, of which only one was positive.

The micrococcus *tetragenus* was tested in 18 cases, 16 being negative and two positive.

The above organisms have been found with varying degrees of frequency in acute inflammations of the upper air passages. In order to observe whether a non-pathogenic organism might excite reactions, the micrococcus cereus flavus was tested in 21 cases, all of which were negative.

In 20 cases of vasomotor rhinitis and asthma no reaction was obtained from the application of the bacterial extracts tested. A comparison of the nasal appearances and of the clinical symptoms present in these negative cases with those cases which gave positive reactions, showed no determinable points of difference which would permit generalization. At the present time no tests have been made with the other organisms whose causal relationship to the acute infections of the upper air passages is probable, such as the micrococcus catarrhalis, the influenza bacillus, streptococcus pyogenes and pneumococcus.

In 15 cases of various disturbances of the nose and throat, in which there was no history of vasomotor symptoms, tests were negative for all the organisms tested. Such cases ranged from nasal obstruction occasioned by septal deviations and hypertrophy of the mucous membrane to acute or chronic inflammations of the pharynx, tonsils and larynx.

ANALYSIS OF CASES.

CASE 1. B., boy 6. Asthma, perennial, three years with eczema. Treated by another physician last year with vaccines without relief. Nose and throat essentially negative. Marked reaction to ragweed, horse keratin, negative to casein and egg. Negative to staphylococcus p. albus extract, positive to aureus.

CASE 2. D., male, 20. Hayfever many years. Sneezing also in winter. Marked sensitization to ragweed. Positive reaction to staphylococcus p. albus, negative to aureus. Nose and throat negative, except for pallor and swelling of mucous membrane.

CASE 3. W., Man, 45. Spring and autumn hayfever, many years. Nose shows pallor and edema, otherwise negative. Positive for grass and ragweed. During past summer severe acute bronchitis with asthma. Since then slowly recovering. Positive for staphylococcus p. albus, negative to aureus, cereus, citreus, and tetragenus.

CASE 4. Mrs. K., 40. Asthma and sneezing, perennial, many years. Nose essentially negative. Suspicious reaction to albus, positive to aureus.

CASE 5. Mrs. M., 40. Vasomotor rhinitis, perennial. Sensitized to strawberries. Marked reaction to staphylococcus aureus, slight to albus.

CASE 6. Mrs. C., 50. Asthma many years, perennial. Polypoid degeneration both middle turbinates. Markedly positive to aureus, slight negative reaction to albus, positive to citreus and tetragenus.

CASE 7. Miss P., 30. Asthma many years, severe, perennial. Marked polypoid degeneration both mid-

dle turbinates. Marked positive reaction to both albus and aureus, negative to "21" (a culture recovered from a severe case of asthma, having the characters of Friedlander), to cereus, citreus and tetragenus.

CASE 8. T., boy, 5. Asthma since 2, perennial, coming of late every two or three weeks, lasting severely for 24 hours, with associated symptom of sneezing and nasal discharge, clearing up after two or three days. October 25, after an asthmatic attack, positive to egg and horse, negative to staphylococcus albus and aureus. November 6, positive reaction to aureus, slight or suspicious reaction to albus, negative to citreus. November 27, tested 10 days after an asthmatic attack, positive to aureus, negative to "21", citreus, tetragenus and albus.

CASE 9. Miss B., 21. Vasomotor rhinitis several years, intermittent, perennial, at times severe. Nose essentially normal except for pallor. Negative for grass and ragweed and domestic animals. Positive for orris root, symptoms increased on using face powders containing this. Negative for rice and talcum. Marked positive reaction to staphylococcus aureus. Negative to albus, "21", cereus, citreus and tetragenus.

CASE 10. Miss J. V. M. R., severe, perennial, but worse in August. Nasal mucous membrane normal. Positive reaction to ragweed and horse. Slight to egg albumen. Marked positive reaction to aureus, moderate to albus. Negative to "21" and cereus.

CASE 11. K., male. Vasomotor rhinitis, at times associated with asthma, perennial. Slight polypoid degeneration mucous membrane. Positive to aureus, negative to albus, cereus, citreus, and tetragenus.

CASE 12. Miss M. Asthma, severe, many years, perennial. Marked polypoid degeneration of ethmoid regions, which have been curetted without relief. Positive to albus and to "21", negative to aureus, cereus, citreus, and tetragenus.

CASE 14. Mrs. Mr. Sneezing at times severe, perennial; normal, but pale mucous membrane. Positive to albus, negative to aureus. After cauterization of sensitive spots in nose, complete relief.

CASE 14. Mrs. W. Sneezing at times severe, perennial. Negative to albus, cereus, positive to aureus.

CASE 15. A., man, 50. Asthma at times severe, perennial. Marked polypoid degeneration ethmoids. Numerous polypi have been removed followed by relief of asthma. Positive to albus and aureus. Negative to "21", cereus, citreus, and tetragenus.

CASE 16. Mrs. C. Marked sneezing with asthma, at times severe, perennial. Advanced polypoid degeneration ethmoids and frontal. Curetting of ethmoid cells six months ago, followed by marked relief. Marked positive reaction to aureus, negative to albus, cereus and tetragenus.

CASE 17. C., boy, 15. Hayfever July to October. Sneezing also during winter. Positive to grasses and to ragweed. Marked positive reaction to aureus, negative to albus.

CASE 18. Mrs. H. Hayfever many years, June to August. Positive reaction to grasses and to ragweed. Nasal mucous membrane negative. Positive to aureus, negative to albus, "21", cereus, citreus, tetragenus.

CASE 19. Miss B., 21. Recurrent colds with asthmatic attacks. Nose negative. Marked reaction to ragweed, horse, and feathers from pillow. Intense cutaneous reaction from fish. Markedly positive to albus, positive to aureus, negative to "21", cereus, citreus and tetragenus.

CASE 20. H., boy, 12. Bronchial asthma since babyhood, each attack associated with acute rhinitis or laryngitis. Positive reaction to egg, negative to hen feathers and to casein. Positive to aureus, negative to albus, "21", cereus, citreus, and tetragenus.

CASE 21. B., girl, 6. Asthma many years. Nose negative. Marked reaction to albus and to aureus. No reaction from either of these extracts when heated to 60. Positive to "21". Negative to citreus and tetragenus.

CASE 22. Miss R. Sneezing years, perennial. Negative to albus markedly positive to aureus, the edema being over a centimeter in diameter, surrounded by marked hyperemia. Heating of this extract to 60 gives a suspicious reaction, in heating to 80 the reaction is negative. Negative to "21", cereus, citreus and tetragenus.

SUMMARY.

These observations show that in certain anaphylactic individuals exhibiting symptoms of perennial vasomotor disturbances of the upper air passages, an immediate and characteristic reaction is elicited by the application to a scratch of the skin of soluble extracts of staphylococcus p. albus, aureus, citreus, and micrococcus tetragenus; also by an as yet unidentified bacillus having some of the characters of Friedländer's bacillus. It is also shown that such individuals are not sensitized equally to these organisms, some patients reacting to one and some to another of the bacteria in question.

Certain cases of vasomotor disturbance clinically indistinguishable from the above showed no reaction to the organisms tested.

Individuals without vasomotor symptoms developed no reaction in any case.

It remains to be shown whether the vasomotor symptoms are actually due in these patients to an infection of the mucous membranes by the organism which gave the reaction on the skin. It is conceivable that the patients may have been sensitized to the special organism by a previous infection of the skin or mucous membranes. Further studies of these and other cases should be carried on by testing with the micrococcus catarrhalis, streptococcus pyogenes, pneumococcus and bacillus influenzae. Examinations should also be made before, during and after an acute attack with the organism suspected in order to observe whether a variation exists in the intensity of the skin reaction at different peri-

ods parallel with the degree of immunity of the individual.

This preliminary report is now published with the object of calling the attention of observers to a possible method of diagnosis, which may prove helpful in the examination of certain previously obscure forms of vasomotor rhinitis and of asthma. If it should be shown by further observations that a group of patients exists sensitized to certain organisms infecting the upper air passages, it would appear possible that the choice and administration of vaccines may be rendered more fruitful of results than has hitherto been the case.

I am indebted to Dr. C. G. Page for the preparation of the bacteriological material.

GUNSHOT FRACTURE OF THE LONG BONES.

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DURING my service in the 22nd British General Hospital in France the past summer, of a little over six weeks, I had 310 new patients admitted to my wards. There were 238 cases of wounds caused by missiles and 61 of these were compound fractures of one or more bones; something over 25%. The other 72 patients were what might be termed cases of civil surgery, or injuries due to military service and not strictly speaking wounds.

In this paper I have excluded fractures of the skull, face, ribs, pelvis, tarsus, carpus and phalanges—16 in all. The remaining 45 cases of fracture of the long bones are alone considered. Eighteen of these presented fractures of more than one bone, and the bones injured were widely separated, such as the humerus and the fibula, humerus and radius, etc., in nine.

The bones of the upper extremity were injured much more often than those of the lower, the numbers being: upper extremity, 33; lower, 13 (one case is counted twice). The left arm was injured more often than the right: left, 33; right, 10. In the lower half of the body the right and left sides were wounded about equally. This is easily accounted for as the upper half of the body is more exposed than the lower, and in shooting the left arm is held forward thus receiving the bullet, but, fortunately, protecting the head and face.

The bones fractured are as follows: Humerus, 12: right, 4; left, 8 (In two of these the elbow joint was destroyed and the upper ends of the radius and ulna fractured). Forearm, 11: right, 5; left, 6. Metacarpals, 10: right, 1; left, 9. Femur, 4: all right. Lower leg, 7: right, 1; left, 6. Metatarsals, 2.

In the above enumeration, cases in which two or more bones were broken are counted only once and are placed in the group of the principal bone injured.



FIG. 1. Bullet wound fracture, shaft of humerus. The bone is badly shattered for a distance of five inches, but there is comparatively slight displacement. The wound of exit was large and there was much laceration of the soft parts.

TYPE OF FRACTURE.

The fractures varied very much in type, depending on the missile and portion of bone involved. All, of course, were compound. Thirty were caused by bullet wounds and 15 by frag-



FIG. 2. Bullet wound fracture, both bones of the lower leg, with comparatively little comminution but many fissure fractures. Both the wounds of entrance and exit were small and healed without becoming infected.

ments of shell casing. The fractures caused by shell fragments were either ordinary fractures with little or no comminution or comminuted fractures such as are seen in civil practice following severe trauma such as an automobile accident. Those caused by bullets were usually of the classical type. If the bullet injured the shaft of a long bone such as the femur or hu-

merus, the wound of entrance was small, the amount of comminution great, the shaft often being entirely destroyed for a distance of two to four inches, and the wound of exit large with fragments of bone protruding and the soft parts badly lacerated. The injuries were much more severe in the femur and humerus than in the bones of the forearm and leg. In the latter, although comminution occurred, it was not as great and was more in the form of fissure frac-



FIG. 3. Bullet wound of hand, showing comminution of metacarpals and phalanges.

tures. Although in the humerus the comminution was great, the displacement and overriding was very slight. This may have been due to the laceration of the muscles resulting in temporary paralysis, but did not hold in fractures of the



FIG. 4. Shell fracture, both bones of the forearm. There was one large wound on the outer side of the forearm. This patient also had a bullet wound of the abdomen and pneumonia.

femur. Where the spongy ends of the bones were wounded there was little comminution and no displacement, but these observations are

based on a few cases. In two cases where the bullet passed through the head of the humerus, both the wounds of entrance and exit were small and the disability slight. Wounds of the lower end of the radius were similar but there was much swelling and many fissure fractures. Fractures of the metacarpals by bullets all showed much comminution but in nearly every instance the wounds of entrance and exit were small.

Wounds of the joints, other than the phalanx, occurred four times. In two cases the elbow

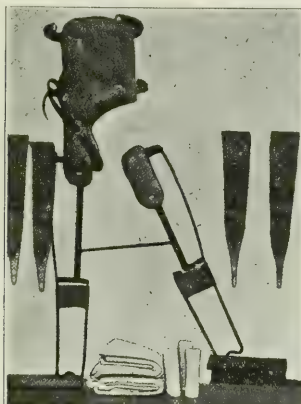


FIG. 5. Jones's modified abduction frame used by the British in treating fractures of the pelvis or thigh. It is somewhat comparable to the Bradford frame but rather cumbersome.*

joint was practically destroyed and in two cases there were fractures extending into the ankle joint.

SEPSIS.

In bullet wound fractures with small wounds of entrance and exit and little comminution, such as occurred in the head of the humerus or bones of the forearm, although there was much swelling, the wounds usually remained clean and the fractures healed in the ordinary manner. Where there was much comminution, or the wounds were large with much laceration of the soft parts, severe sepsis was the rule. In twelve cases there was infection of the wound with a gas-forming bacillus, besides the usual pyogenic germs. Two of these cases came to amputation, and one died. I do not consider the infection was alone responsible for the amputation in either, as in one, a fracture of the radius, the brachial artery was divided at the bend of the elbow, while in the other, a fractured fibula, and the fatal case, the man had lain in the rain between the trenches for 36 hours and also had a compound fracture of the humerus, pneumonia and a bloody diarrhoea.

COMPLICATIONS.

Many patients presented multiple injuries. Thus two cases had wounds, other than the fracture, infected with a gas-forming bacillus. Two had pneumonia and one of these also had a bullet wound of the abdomen. Four cases of fracture of the metacarpals had a division of one or more tendons of the fingers, while three were complicated by fractured phalanges, and one case of fractured metatarsal also had a badly comminuted fracture of the os calcis. One case of fracture of the tibia was complicated by a fracture of the rib and a wound of the arm, all three wounds being caused by different rifle bullets.

TREATMENT.

In treating these cases and in drawing deductions as to the best method of treatment the work was unsatisfactory. It was a rule of the hospital that a patient who could not be discharged practically well in three or four weeks should be sent to England at once. Therefore although at times a case could be kept for some weeks, in most instances, as soon as the initial swelling had gone down and the danger of severe sepsis passed, the patient was discharged. This was usually in two or three days and before any definite line of treatment for the fracture could be instituted.

In most cases the first problem was that of combating sepsis by free drainage, and, in cases with gas bacillus infection, removal of necrotic tissue, fragments of clothing, etc. Fractures of the forearm and lower leg in which both wounds of entrance and exit were small were considered clean and usually healed without sepsis. In frac-

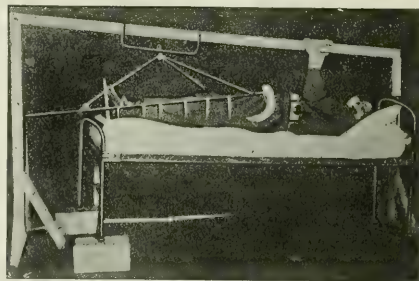


FIG. 6. A modified Thomas knee splint suspended from a Balkan support. The arrangement is somewhat similar to Smith's anterior splint. The patient can also assist the nurse while changing the sheets, etc., by lifting himself by the crossbar of the support.*

tures of the shaft of the humerus and thigh with much comminution and large wounds this was not to be expected, although one fracture of the thigh did remain clean.

The cases came to us from the Clearing Hospital in one of the many types of splints used in the British army. These splints are numberless, and while many are large and unwieldy, some

are very useful and answer the purpose of temporary immobilization well. The usual dressing on a fractured humerus when admitted to the hospital was an internal angular splint on the inner surface, not anterior, of the arm, a modification of a Thomas hip splint, or an external angular aluminum splint. Fractures of the femur were commonly in a Thomas hip splint, and fractures of the lower leg usually in a posterior metal splint with a foot piece.

It was often found necessary to leave these or other temporary splints on for several days as the swelling is usually great, and until this has subsided and the sepsis is overcome, it is useless to attempt any permanent dressing. In the humerus the temporary splints were quite satisfactory. It was often possible to swing the arm from a support over the bed, known as a Balkan splint, and use a constant drip apparatus in cases of gas bacillus infection. The English in fractures of the lower leg often use a splint similar to Smith's anterior splint which may also be swung to the Balkan support. The treatment was modified by the complications, such as the presence of other fractures or wounds, pneumonia, and severe infections.

I had only four cases of thigh fracture, three of which were severe, high, with much comminution, large wounds and gas bacillus infection. These were treated by extension on Bradford frames raised above the beds on blocks to allow a constant drip dressing to be used. A basin was placed under the buttocks to catch the water.

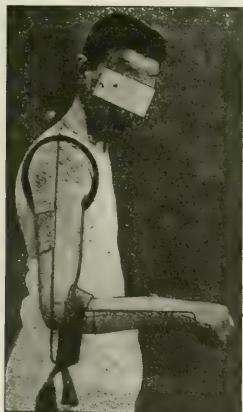


FIG. 7. Modified Thomas knee splint used to obtain extension in fracture of the shaft of the humerus.*

These fractures are much more comfortable and do better when the overriding is overcome by traction. Later, these cases were put up in plaster spicas with large windows to allow proper dressing of the wounds and metal bridges to strengthen the plaster. Plaster of Paris casts or splints in some form, made to suit the indi-

vidual case, make the best permanent dressing for nearly all these fractures. When the fracture is of the lower leg with large wounds in the calf, it can be perfectly immobilized by applying a plaster boot, a circular cast at the knee and two or three metal bars across the defect, the ends of which can be incorporated in the plaster as it is put on. We found the Hawley table of great assistance in applying these plasters. In general I should say the average English surgeon



FIG. 8. Wallace's splint applied to a fractured thigh. There is a perineal crutch as in a Thomas knee splint. The foot is strapped to a foot piece and traction made by means of a screw.*

did not appreciate the value of plaster and did not know how to use it. My patients unfortunately were discharged to England too soon to have a plaster applied and I was able to use it in only nine cases, three fractures of the thigh, four fractures of the lower leg, one fracture of the forearm and in one fractured metacarpal. Some of these were put on by Dr. Steenburg the day I left and I did not see them, but he tells me they were very satisfactory. Clean fractures were treated as similar fractures would be in civil practice.

DRAINAGE.

Most of the wounds, where large, had some form of drainage introduced at the Clearing Hospital, usually a large rubber tube for which we substituted cigarette wicks or rubber tissue.

As to the desirability of removing the loose fragments of bone in the badly comminuted fractures, I did not follow them long enough to form an opinion. If the fragments were loose they were removed, but in most cases they were adherent to periosteum, and were left in the wound.

I personally had no case of nerve injury or secondary hemorrhage.

I think the average English surgeon is more radical and more ready to amputate in these severe compound fractures than we are. It is to

* FIGS. 5, 6, 7, and 8 are copied from a small book issued by the British Government on the treatment of injuries in war. They are introduced to show the type of splint used in the British army.

be regretted that one man could not have charge of the cases from the beginning as it is discouraging to work over a case and then learn that the limb was amputated after the patient's return to England. This did not happen to me personally as far as I know, but did to some of the men.

I hope in a year to be able to determine the results in some of these cases.

ANALYSIS OF CASES.

Humerus, 12 cases. Shaft: 7 cases; 4 bullet wounds, 3 shell casing. Displacement in all slight. All fractures more or less comminuted, those caused by bullet wounds being badly so. In bullet wounds, wound of entrance usually small and wound of exit large.

Head, 2 cases. Little comminution and no displacement. Both bullet wounds and wounds of entrance and exit small.

Lower End, 3 cases. In two of these the radius and ulna were also fractured and the joint practically destroyed. In one the internal condyle only was fractured. One bullet and two shell casing wounds.

Gas bacillus infection in the arm in four cases, and in a wound in the leg of a fifth.

Ulna, 2 cases (Other than the two mentioned above). Both bullet wounds somewhat comminuted, but without displacement.

Radius, 6 cases (Other than the two included with the cases of fractured humerus). Head, one case from shell fragment with slight displacement.

Shaft, 2 cases. Both bullet wounds. One comminuted and one with many fissure fractures.

Lower End, 3 cases. All bullet wounds. Wounds of entrance and exit small. Many fissure fractures but no displacement.

One case had infection with a gas bacillus and the brachial artery divided at the bend of the elbow and it was necessary to amputate for gangrene. A second case was complicated by a bullet wound of the lung.

Both Bones, Forearm, 3 cases. Two shell, one bullet wound. All wounds large and fractures more or less comminuted. Much displacement in one complicated case due to a shell fragment.

One case complicated by a gas bacillus infection, and one by pneumonia and a bullet wound of the abdomen.

Metacarpals, 10 cases: Multiple, three. Fracture of one or more phalanges with partial disorganization of joint three cases. One or more tendons divided in four cases, one by a bullet, and three by fragments of shell. All fractures comminuted with more or less displacement.

Femur, 4 cases. All bullet wounds. Three fractured just below trochanter with much comminution and displacement. Wounds large and infected with a gas bacillus.

One fracture just above knee with slight comminution and no displacement. Both wounds of

entrance and exit small. Bullet had only grazed bone.

Tibia, 3 cases. All bullet wounds, two small and one of moderate size. Two slightly comminuted with fissure fractures extending into ankle joint. One was complicated by a fractured astragalus and one with a fractured rib and a wound of the arm.

Fibula, 2 cases. Both shell wounds. One complicated by a gas bacillus infection of both legs and the right arm, the other by a compound fracture of the humerus and pneumonia. (This case was amputated for gangrene and the patient died.)

Both Bones, Leg, 2 cases. Both bullet wounds of the lower third of the leg, slightly comminuted but without displacement. The wounds in both were small but in one were infected by a gas bacillus.

Metatarsals, 2 cases: 1 bullet, 1 shell wound. Bullet wound fractured all five bones and was complicated by a gas bacillus infection. The shell wound also had a comminuted fracture of the os calcis.

ABNORMALITIES OF THE HEART IN INFECTIOUS DISEASES.*

BY CLIFFORD S. CHAPIN, M.D., GREAT BARRINGTON, MASS.

In considering the state of the circulation in febrile conditions, it is necessary to bear in mind three facts, viz: that the heart's action is modified by an increase in temperature, that the heart reacts differently according to the toxins produced by the agent causing the fever, and finally, that the heart itself may be the seat of the conditions. Recent researches demonstrate conclusively the invasion of the heart by the specific organism in rheumatic fever, pneumonia, typhoid fever, diphtheria, erysipelas, influenza, and various septic infections. The results of such invasion are shown in the occurrence of endocarditis, myocarditis, and pericarditis. The symptoms evoked in such invasions are not always distinctive, and may resemble the symptoms induced in the heart by febrile conditions alone, or by toxins produced from other sources in the body. I dwell upon this because an attempt should always be made in febrile conditions to judge rightly the effects on the heart. One cannot but be struck, for instance, by the fact that people with previously seriously damaged hearts may pass scatheless through severe attacks of pneumonia or typhoid fever, while the young and vigorous may succumb after a few days' illness on account of the implication of the heart in the disease.

Another point to bear in mind is that in the invasion of the heart the specific organism rarely

* Read before the Berkshire District Medical Society, June 24 1915, as part of a Symposium on Heart Disease.

affects one tissue alone. In order to be exact and methodical, writers usually describe separately the symptoms of endocarditis, myocarditis and pericarditis. But if one reflects on the nature of the symptoms, such as the condition of the pulse, its strength, rate, and rhythm, the size of the heart, and the precordial distress—symptoms which are usually included in the description of endocarditis and pericarditis—it will be realized that they are not really the manifestations of endocarditis or pericarditis, but are the signs of a myocardial affection. One must consider carefully the murmurs arising in the course of a febrile attack, even in rheumatic fever, for the presence of a murmur may not necessarily mean the invasion of the mitral valves by the inflammatory process, but may be due to the toniccy of the poisoned heart muscle failing and giving rise to incompetence of the mitral orifice,—due, therefore, not to an endocardial, but to a myocardial affection. Endocarditis and pericarditis, both acute and chronic, bulk so largely in medical literature only because an abnormal sound invariably impresses the mind more than an abnormal sign perceptible by the other senses, and the easy recognition of the valvular murmur, and the friction sound has led to the associated symptoms being ascribed to the same lesion.

THE FEBRILE HEART.

By this term I mean the changes induced by the rise in temperature. The whole circulatory apparatus is remarkably sensitive to alterations in temperature, whether arising from external sources or due to changes within the body. The most striking of these is the change in rate—a rise in temperature increasing the rate, and a fall diminishing it. In the more simple febrile affections, there is a certain correspondence between the height of the temperature and the rate of the heart's contraction. Roughly speaking, there is an increase of from eight to ten beats with a rise of temperature of one degree F. This does not hold universally, but any considerable departure from this rule should always arouse watchfulness and suggest the possibility of other complications, such as the involvement of the heart in the infection.

In the simple febrile heart, the radial artery enlarges and the pulse remains of good strength, particularly during the diastolic phase of the cardiac cycle. The heart itself shows little change at first, beyond having its rate abnormally accelerated by exertion. The sounds are clear and distinct, and there is no increase in size. With long continuation of the fever, a certain amount of dilatation may arise. This most readily occurs on the right side of the heart, particularly if the pulmonary circulation is interfered with, as by a pneumonia or a pleuritic effusion, or by lying a long time on the back, as during the course of typhoid fever. The sounds may become feeble, or systolic murmurs

may develop at the tricuspid and mitral orifices, and the characteristic pulsation of the right heart in the epigastrium become visible. In many of the minor febrile attacks, the course is modified by the nature of the toxins generated. A rise of a few degrees of temperature may provoke an undue frequency, 120-140, and with the subsidence of the temperature the rate may speedily fall to normal, leaving no ill effects.

ACUTE FEBRILE AFFECTIONS OF THE HEART.

The lesion induced by the invasion of the heart by specific organisms is rarely limited to one structure or tissue, so that it would be better to use the term carditis than to employ such misleading terms as endocarditis and pericarditis. This will be brought out more clearly when an analysis is made of the symptoms present in any given case; and I shall endeavor briefly to summarize the symptoms and try to apportion them to the particular tissues affected. I do this here, because by the appreciation of the nature of the primary lesion we are better able to understand the conditions found many years after, when the cicatrizing process has wrought other changes.

SYMPTOMS AND SIGNS IN MYOCARDITIS.

The rate and rhythm are the most easily recognized. Seeing that a rise of temperature alone induces an increased frequency, it is impossible to apportion the relative influence of this and of the myocardial infection. But many cases of moderate fever have a heart rate greatly accelerated, and then we can infer there is some other factor at work than the rise in temperature. It would be of great interest to know the mechanism by which increased rate is brought about by myocardial lesions, whether through nerve stimulation arising reflexly from the inflamed tissue, or from the increased irritability of the muscle, particularly of the tissue in which the stimulus for contraction arises. But here such an inquiry would be purely speculative.

Changes in rhythm come under a different category, and in irregularity we often get a clue to the changes that are going on in the muscle. The arrhythmia due to purely nervous influences is generally abolished during the excitation of the heart by the fever—the chief exception being the arrhythmia due to vagus stimulation in affections of the brain, as in tubercular meningitis.

The most characteristic evidence of direct damage done to the muscle of the heart is the irregularity or pulse intermission, due to the dropping out of ventricular systoles, because of the damage done the auriculo-ventricular bundle by the lesion.

Evidences of myocardial affections can be found in the changes in the size of the heart. It is well to remember that the size of the heart

may very speedily become increased in the course of a febrile affection of the heart, as in rheumatic fever, diphtheria, etc. In such cases, the sounds often become very faint, and soft murmurs may arise at the mitral and tricuspid orifices, and simulate valvular changes.

SYMPTOMS AND SIGNS IN ENDOCARDITIS.

The only direct evidence of acute endocarditis is the presence of murmurs at one or other orifice of the heart. For practical purposes there are only two murmurs which need to be considered here, viz: a mitral systolic murmur and an aortic diastolic. It is not always easy to tell whether the appearance of a murmur during a febrile attack is due to involvement of the mitral valve in an endocarditic process, or to the relaxation of the muscle supporting the orifice. A diastolic aortic murmur is, as a rule, diagnostic of the involvement of the aortic valve in some destructive process. At first this murmur is so faint that one is simply conscious of the fact that the sound does not end with sufficient abruptness. Gradually, however, this passes into a very soft short whiff at the end of the second sound, becoming day by day more marked.

In the vast majority of cases, the murmurs due to endocarditis are not definitely recognized until some time after the subsidence of the fever—when the sclerosis sets in. This is particularly the case with presystolic mitral murmurs, which are never recognized during the acute condition which induces the lesion, unless there is narrowing of the mitral orifice on account of vegetations. The formation of vegetations at the mitral and aortic orifices may give rise to murmurs, indistinguishable from those due to destruction of the cusps. The presence of a musical murmur may generally be assumed, particularly in acute cases, to be due to a vegetation. An attack of hemiplegia during an acute febrile condition may generally be ascribed to an infarct from a valvular vegetation, and infarcts in any other organ may be assumed to arise from the same cause.

SYMPTOMS AND SIGNS IN PERICARDITIS.

Until the introduction of auscultation, dry pericarditis was a disease discovered on the post-mortem table only. The only evidence we have of its presence is the characteristic superficial to-and-fro murmur produced by the movements of the heart. Its discovery is usually accidental, and made when the heart is examined as a matter of routine. There is no other distinctive sign associated with it, and, in marked contrast to dry pleurisy, it is essentially a painless complaint. When pains are associated with its presence, it will invariably be found that there is evidence of a myocardial affection.

Pericarditis may arise in the course of a number of chronic complaints, as in diabetes and Bright's disease, or in the course of an acute disease, as pneumonia or rheumatic fever. Some-

times one comes across it quite accidentally—the patient, not feeling quite well, consults his doctor, and in the course of an examination this is detected. Such patients may go quietly about their occupation for many weeks with a well-marked to-and-fro murmur, and suffer no further trouble.

When effusion takes place into the pericardial sac, there is an increase in the area of cardiac dullness, which assumes a somewhat characteristic shape. It reaches up to or above the second rib, and if the area be mapped out, it will have a somewhat pear-shaped character. There is an absence of the heart's movements at the lower point to the left, and this should always arouse the suspicion of effusion where there is an increase in the heart's dullness. Ewart describes a small area of dullness behind at the base of the left lung. This is important to remember, for an increase in the size of this area may cause an extensive pericardial effusion to simulate fluid in the pleural cavity.

The question of pericardial effusion, embarrassing the work of the heart, has arisen on account of the results of experimentally distending the sac with fluid. We do not find any very serious embarrassment of the heart from extensive pericardial effusion, the reason being, probably, that while the normal pericardium is a more or less inelastic bag, with the inflammatory invasion it becomes distensible, and therefore able to accommodate an enormous amount of fluid with little embarrassment to the heart.

THE HEART IN RHEUMATIC FEVER.

It is the frequent implication of the heart which makes this one of the most formidable diseases in temperate climates; and the study of the heart affections is one of much practical importance. Experimental evidence has shown that a diplococcus, which is present in human cardiac tissues damaged by rheumatic fever, can produce endocarditis, pericarditis, and fatty degeneration of the myocardium with dilatation of the heart and formation of submiliary nodules both in rabbits and monkeys. These animals may sometimes recover from this acute endocarditis and a healing lesion be found later.

The chief cardiac lesions in man are: (1) acute dilatation of the heart, (2) endocarditis, and (3) pericarditis. In almost all the severe cases, however, the damage is a complex one, that is to say, the endocardium, myocardium and pericardium are affected, and to this condition the term "carditis" is often applied.

There are very considerable differences in the development of these lesions. Sometimes the attack is rapid and severe, and in a short time the heart is terribly injured; in others there is an insidious onset and a gradual down-hill progress; while in others the damage is as fleeting as that to the joints. It is accordingly most essential to recognize the earliest warning of heart disease, in order that the patient may be at once

placed under strict treatment. This warning is, as a rule, acute dilatation of the heart. The evidences of it are the following: (1) A slight rise in the frequency of the pulse rate. (2) The cardiac impulse becomes diffuse and extends beyond the vertical nipple line. (3) The area of deep or relative cardiac dullness is increased to the left, and sometimes to the right and upward. (4) The first sound at the apex becomes short, and the second sound in the pulmonary area is accentuated. (5) A soft systolic murmur can, not infrequently, be detected internal to the left vertical nipple line. These are the earliest signs of rheumatic heart disease, and this dilatation may entirely disappear.

Acute Dilatation. The rapidity with which dilatation may occur is most remarkable, and this is true of both the adult and the child. The explanation, however, is not easy unless it be associated with some sudden damage to the cardiac nerves and loss of muscular tone. The patient shows but few signs of cardiac dilatation unless it is acute and severe. If he has not been confined to bed there is shortness of breath on exertion, with a sensation of faintness and weakness. When more severe there are muscular weakness, pallor, restlessness, and well-marked dyspnea.

Endocarditis. The valves on the left side suffer more than those on the right, although in childhood the tricuspid valve is not infrequently damaged to a small degree. Acute simple endocarditis gives rise to but few symptoms, and it frequently happens that a patient comes under observation with a valvular lesion of which he can give no clear history. On this account there are a few more important rules in medicine than "in all cases of suspected rheumatism to examine the heart repeatedly." A rise in temperature of a degree or more, accompanied with pain in the chest, palpitation, and breathlessness, are suggestive, and examination of the heart may show that the action is unduly rapid, and that there is some dilatation.

The malignant type of endocarditis is to be suspected when there is a persistent and irregular fever and the appearance of the patient suggests severe poisoning. In many cases there is a history of previous attacks of cardiac rheumatism, and in some, rigors occur, which may be repeated and yet no abscess formation result. One striking feature in the heart is the persistent excitement. The cardiac murmurs may be unusually loud, or vary in character. Anemia, sweating, diarrhea, infarction, and purpura are also important symptoms of this type. Some of these cases run a very protracted course, extending over months; others prove rapidly fatal. In other cases the diagnosis between simple and malignant endocarditis may hang in the balance for weeks and then the disease may slowly subside, leaving much damage. The malignant type is rare in childhood.

Pericarditis. The most serious form of heart disease in rheumatism, next to malignant endocarditis, is pericarditis—not so much on account of its intrinsic harmfulness as on account of the severe type of infection which accompanies it, and the involvement of the myocardium. It is more frequent in childhood than in adult life. The most characteristic examples occur in the first week of the rheumatic attack; but there is no period when it may not appear.

The early symptoms of acute pericarditis are a rise of temperature, precordial pain, and dyspnea. The pulse is excited and the tension low. Pericardial friction is usually detected within twenty-four hours, at the base of the heart, and may rapidly become audible over the entire cardiac area. A more unusual symptom is delirium. The distress in the adult is great, and shows itself in the anxious face and orthopnea; on the other hand, some children show curiously little discomfort. The great enlargement of precordial dulness, so frequent in pericarditis, is chiefly the result of dilatation, and not of a large effusion. Ill-omened symptoms are vomiting, restlessness, delirium and lividity, with progressive signs of cardiac failure. A first attack is not as a rule fatal, but pericarditis is the most frequent cause of death in rheumatic fever.

Attacks of rheumatic fever may complete their course with no affection of the heart. In some instances the heart may be affected and give rise to no positive sign; and it may be only after months or years that a murmur or irregular action indicates that there must have been some affection of the heart which the symptoms of the subsequent sclerosing process have revealed.

While the foregoing gives briefly the main points of the heart affection in rheumatic fever, it also holds good for the condition in other infectious diseases.

THE HEART IN PNEUMONIA.

The examination of the heart itself, aside from the rate, may reveal nothing abnormal, but very often, especially during the latter part of the attack, we find functional murmurs either with or without dilatation. In this latter condition the right side is the greater sufferer by reason of the obstruction to the pulmonary circulation.

Cardiac weakness in pneumonia may arise from a number of causes; the commonest and most important of these are toxemia, extensive pulmonary consolidation, and hyperpyrexia. The first of these may result either from a direct action of the poison upon the muscle itself—cloudy swelling, myocarditis—or indirectly through vasomotor paresis. Sudden syncope may occur at any time in the course, although this is rare. The pulse is rapid, small in volume, and the attacks, even in patients who recover, may last six or even twelve hours. The usual symptoms of heart weakness, including cyanosis, dyspnea, cold extremities, and ner-

vous derangements, occur. Critical collapse, or at least a tendency toward it, is quite common. It sometimes appears at the beginning of the crisis, more rarely in the midst of it. It is accompanied by chilliness, cold perspiration, dyspnea, cyanosis, a weak rapid irregular pulse, mental incoherence and subnormal temperature. With judicious stimulation, these attacks are usually passed in safety, although death in the course of them is by no means unknown. Collapse coming on a day or two after the crisis is much more grave, being usually an indication that the myocardium has sustained serious damage. It sometimes happens that the patient falls back dead, after sitting up, although there had been no indications of danger. In such cases one naturally thinks of an acute cardiac dilatation or a pulmonary thrombosis as the cause of death. There are two conditions that are looked upon as signs of grave complications in pneumonia—the occurrence of an occasional irregularity before the crisis, and a pulse rate of over 140 per minute. Neither of these is necessarily a fatal symptom.

THE HEART IN DIPHTHERIA.

The complications here are so varied that danger may arise in several quarters. The heart muscle itself may be the seat of profound changes, the symptoms somewhat resembling those in rheumatic fever. But in diphtheria, more than in any other acute disease, there is a tendency to fatal syncope. The gravest sequel, and the one responsible for the greatest number of deaths occurring in apparent convalescence, is the effect of the toxin on the heart. In every case of diphtheria, mild or severe, the possibility of heart complications should always be in the mind of the physician, and frequent examinations should be a routine, no matter whether there are any symptoms referable to this organ or not. The heart complications are a phase of the degenerative changes in the nervous system, although in some of the fatal cases a degenerative change in the heart muscle has been found. Murmurs, usually systolic, are observed in the vast majority of patients with diphtheria. Vomiting may draw attention to a cardiac complication. Before this symptom there is usually a softening of the first sound and shortening of the diastolic pause. Pallor and restlessness are very early and grave symptoms. There is no edema and cyanosis is uncommon. The heart may or may not show dilatation, but gallop rhythm or signs of heart block are present. The pulse may remain normal, but more often is rapid. When a sudden drop in the pulse occurs, the condition is very serious.

The following conclusions with reference to heart complications in diphtheria are of interest, the special points being: (1) The great frequency of heart murmurs and irregularity of the pulse. The prognosis does not depend on the mere presence of these signs, but upon the sever-

ity of the infection, the length of time without treatment, the rate and degree of irregularity of the pulse, and the presence of the graver signs of cardiac disturbance. (2) Moderate disturbance of the heart is very common; severe complications are infrequent. (3) Frequent examinations of the heart are necessary really to determine its condition, because of the marked changes in rhythm from one hour to the next. (4) Gallop rhythm, late vomiting, and epigastric pain and tenderness are important as danger signals of severe heart complications. The association of late vomiting with gallop rhythm renders the outlook almost hopeless. (5) Antitoxin does not affect the heart unfavorably, but, on the other hand, its early use prevents the appearance of grave heart complication. (6) Bronchopneumonia is a more frequent fatal complication of diphtheria than heart disease; sudden death from heart disease is very rare when patients are kept in bed for a proper period. (7) Prolonged rest in bed is necessary in all severe cases; it is not necessary to keep all patients in bed who have cardiac murmurs and a pulse rate which is somewhat irregular and increased in rate. One should be governed by the stage of the illness and the general condition. If no serious heart trouble has developed within four weeks, the patients are usually safe from this complication. (8) Heart murmurs and irregularity are of long duration in many cases, and make it necessary to watch the condition of the heart long after convalescence in all severe cases.

THE HEART IN SCARLET FEVER.

Endocarditis and pericarditis are special complications in scarlet fever. Two types are recognized: septic and simple or toxic, but the distinction is clinical and not clearly drawn. Septic endocarditis is rare and practically occurs only in severe attacks complicated with throat sepsis. Simple endocarditis may be due to toxins acting on the endothelium, but the trend of opinion is that there is a local infection with bacteria of less virulence than those causing the septic form. The time of occurrence is especially in the second and third week of the attack. Fever may occur at the outset but is not infrequently absent. A rising pulse rate is the commonest early sign, except murmurs. There is usually some dilatation with increase of the area of dullness. Endocarditis is very easily overlooked, and care should be taken to examine the heart frequently. Murmurs vary much in intensity and duration, and as "functional murmurs" are common, early differential diagnosis is not always possible.

THE HEART IN TYPHOID FEVER.

The heart cannot be said to show any changes peculiar to typhoid fever. The variations in the rate, character of the sounds, etc., may be due to several factors, such as fever, toxemia, vasomotor paralysis with a secondary effect on the

heart muscle, and myocardial changes. Dilation may be present, but it is not often marked, and is more common on the left than on the right side. With the progress of the attack the impulse usually becomes feeble and the apex beat may be diffuse or completely absent. The heart sounds may be normal and unchanged throughout, as is seen in mild attacks, but as a rule some change is noted. The first sound usually becomes feebler, and may have a muffled uncertain quality, which may progress until it becomes inaudible. The second sound may become sharper and more accentuated as the disease progresses. Endocarditis and pericarditis are rare. To lay down definite rules by which myocarditis may be recognized is not possible. The appearance of a systolic murmur is suggestive of myocarditis but may be due to other causes. The changes noted in convalescence, either in the way of marked rapidity or of slowing of the pulse-rate, occasional intermittency or irregularity, suggest myocardial changes.

THE HEART IN SEPTIC INFECTIONS.

There are a great many septic infections that injure the heart, either from toxemia or by a specific organism invading the heart. In the latter case, the endocardium is frequently attacked, and the disease is then described as septic endocarditis. In these cases, there is also invasion of the myocardium, and it is the profound depression of the heart muscle which is often the grave element. In pyemia and puerperal septicemia, we get conditions of profound gravity caused by certain organisms. The *pulse* in these cases gives the most trustworthy information. It is small, soft, and easily compressed, not necessarily very rapid, and the temperature need not be high (101-2°). The heart shows little change except that the sounds are feeble, the patient is lethargic, the face is slightly sallow or pale and sunken. The aspect of the patient, taken with the rate of the pulse, affords assistance in recognizing the condition. I dwell upon this because some are unnecessarily frightened at the occurrence of a post-partum rise of temperature of trivial significance, while others do not recognize the significance of the heart symptoms when danger actually arises.

In acute disease due to some infective agent, the prognosis depends upon the nature and intensity of the infection. So far as the heart is concerned, judgment must be suspended until the cessation of the active lesion. As these effects may linger on for some time, it is manifestly impossible to do more than lay down certain general rules. After acute infections, such as rheumatic fever, and after subacute affections, no prognosis should be given until all the symptoms of the original affection have disappeared. If the heart has resumed its normal aspect, in size, rate, and rhythm, we may gather that the damage has been slight and that the future is hopeful. The presence of the youthful

irregularity may be a further guarantee of the integrity of the myocardium. If some evidence of damage persists, then we must recognize this, lest it be due to the persistence of some low inflammatory condition which leads to the formation of fibrous changes, in which case it may be a long while before the changes are sufficiently stationary to permit of an opinion.

When the real nature of the trouble is appreciated in acute affections of the heart, it will be realized how powerless we are directly to modify the disease process. In vaccine or serum therapy, there is a promise of a specific remedy in each case to meet the special organism causing the mischief. But so far our efforts have been attended with little success.

THE HEART IN PREGNANCY.*

By ERWIN H. TAYLOR, M.D., PITTSFIELD, MASS.

It was formerly thought that the heart became hypertrophied during pregnancy, but more recent investigation has shown that this is not the case, and that what was formerly considered an enlargement is in reality only a displacement of the heart, caused by the pressure of the growing uterus crowding up against the diaphragm.

In every pregnant woman the heart should be examined the first time that the patient comes under the observation of the attending physician, to determine whether there is any disease. If any trouble is found, repeated examinations should be made as often as deemed necessary to direct proper treatment.

In most cases valvular diseases of the heart are present before the patient becomes pregnant, but they may occur during pregnancy from septic infection or rheumatism.

Valvular lesions of the heart, if not well compensated, are very serious for the pregnant woman, and end fatally in a large percentage of cases.

Many complications may arise, one of the most frequent of which is abortion. This may occur as a result of placental apoplexy or from an accumulation of carbon dioxide in the blood, which irritates the uterine muscle.

Other complications of importance to be feared are fresh outbreaks of endocarditis, renal congestion, fatty degeneration of the papillary muscles of the heart, and, especially, congestion of the lungs.

Mitral lesions are considered the most serious in pregnancy, and Hirst places the mortality as high as 53%.

Well compensated heart lesions may cause no more trouble as a result of pregnancy than a normal heart, but all such cases should be closely watched. As long as compensation is good no

* Read before the Berkshire District Medical Society, December, 1919, as part of a Symposium on Heart Disease.

special treatment is necessary, but on the first appearance of signs of decompensation, active treatment should be instituted.

The urine should be examined more frequently in pregnancy with cardiac complications than in the normal woman. Just how frequently depends upon the severity of the case, but certainly as often as two weeks in all cases. The patient should be instructed to take a simple diet, with a minimum of meat and sweets and foods most likely to produce flatulence. She should avoid overwork, and rest as much as possible, especially in the recumbent position. Worry and excitement should be guarded against as far as possible.

The most dangerous time is just after the birth of the child, when an extra quantity of blood is suddenly thrown back upon the heart. Experience shows that when the discharge of blood is profuse heart failure seldom occurs, and thus a reasonable loss of blood should be encouraged in these cases. In case of threatened heart failure, and if not much blood has been lost during labor, venesection is the best form of treatment, and from 8 to 16 ounces of blood should be withdrawn. Nitroglycerin hypodermically is the best heart stimulant during labor and directly after.

Digitalis should be used hypodermically or intravenously during the first stage of labor, in good doses. One of the most effective ways of employing digitalis in cases of this kind, where prompt action is important, is to use the Tr. of digitalis in normal salt solution, intravenously.

In serious cases deep incisions may be made in the cervix and dilatation accomplished as rapidly as possible. Forceps should then be used to deliver the child.

It is claimed that reduced intra-abdominal pressure after expulsion of the child from the uterus leads to death post partum. This reduced pressure may be partly overcome by placing a sand bag on the abdomen.

In case of threatened heart failure in an asystolic woman, she may be delivered in a high reclining attitude, as this position helps to relieve some of the pressure on the diaphragm.

Heart lesions may render the continuance of pregnancy so serious as to raise the question of the advisability of emptying the uterus. I believe there should be no hesitation in doing this in any case of decompensated valvular lesion where the continuance of pregnancy greatly endangers the patient's life.

HEART DISEASE IN PREGNANCY AND LABOR.*

By JAMES LINCOLN HUNTINGTON, M.D., BOSTON.

STUDY the causes of maternal death in the statistics of any lying-in hospital,—placenta previa

* Read at a meeting of the Boston Surgical Fortnightly Club.

puerperal fever, eclampsia,—then consult the literature, and the references to these complications are legion; whole chapters concerning each one appear in every work on obstetrics, and the medical journals teem with such articles. Turn back again to the mortality statistics and another quite as deadly obstetrical complication will greet the eye,—heart disease, especially mitral stenosis. Again turn to the text-books and the medical journals. Instead of chapters we find an occasional paragraph and the medical journals practically omit any mention of this very important subject. It is true that nearly half as many patients have died from cardiac lesions in the last five years in the departments of the Boston Lying-in Hospital as have died from puerperal fever.

It is very hard to explain this situation, for it is a very real problem that every obstetrician has got to face, and which is often going to tax his skill and judgment to the utmost.

The subject is such a broad one that I am going to limit this paper to a question of the treatment of chronic valvular disease of the heart as complicated by pregnancy and labor.

Let us take a look at the effect of pregnancy on the normal heart. Larcher in 1827 wrote of the hypertrophy of the heart during pregnancy; many of the French authorities have clung to this belief. Gerhardt in 1862 proved quite conclusively that this was not the case, and most of the Germans have followed his teaching in this regard, although we have Dreyel in 1891 writing from Munich so conclusively about the increase in the weight of the heart during pregnancy and the puerperium that Prof. Williams of Johns Hopkins in 1904 seems inclined to accept this teaching as an accepted fact. However, Alfred Stengel and W. B. Stanton in Philadelphia in 1904 published an article on "The Heart and Circulation in Pregnancy and the Puerperium." This was based on a series of exhaustive observations by these trained internists, and would seem to settle the question. Let me quote from their monograph: "The conclusions arrived at by us were that there is not, during pregnancy, any hypertrophy of the left ventricle, nor any special increase in its work." They did find evidence of constant distention of the conus arteriosus and root of the pulmonary artery, also during the later months of pregnancy continuous dilatation of the right ventricle of very moderate degree.

In spite of this we find Tuszkai of Budapest speaking, in 1913, as if hypertrophy of the heart was an accepted fact in pregnancy, and quoting Jorissen as claiming that it occurs in the initial stage of pregnancy. But Newell, in his very careful and exhaustive paper of about the same date, accepts the statements of Stengel and Stanton as proven, and we are more than willing to agree with him after reading the mass of evidence.

What are the lesions of the heart we are deal-

ing with and how do they compare? Also, how are they affected by pregnancy and by labor, and, most important of all, how can we treat these conditions to offer the most favorable outcome?

All authors agree that mitral stenosis is the most serious of all the single heart lesions that may complicate pregnancy, and that when further complicated by mitral regurgitation the prognosis becomes necessarily more grave, the mortality for these lesions being given as high as 50%. Simple aortic disease has a mortality of 25%, while mitral regurgitation with no history of a break in compensation has really no serious effect on the prognosis of an otherwise normal case, but should be borne in mind as pointing towards the necessity of making this labor as easy as may be.

Of course each case must be considered on its merits and, above all, in considering the prognosis and treatment, we should carefully study the way the heart has responded to the strains it has been subjected to in the past, also the amount of strain it has suffered.

Dr. Newell sums up the case most adequately: "Therefore, in giving advice to the individual patient, the factors present in her case must be carefully considered, irrespective of what the general statistics show. If a patient, although she has a definite valvular lesion, has never had a failure in compensation; if she is at an age at which her powers of recuperation can be counted on to restore a possible break in compensation; and if she understands the importance of taking care of herself during pregnancy, and can be under careful observation, such a patient may fairly elect to run the risks of pregnancy, if the satisfaction of having children outweighs in her mind the possibility of death, the inevitable shortening of her life and a possible invalidism following the pregnancy; but it is not fair to advise her to have children unless she fully understands the risks involved."

In considering the treatment of these cases it will readily be admitted that anything which can aid us in anticipating a break in compensation will be of the very greatest help in guiding us in our treatment, and so I am minded to quote from Tuszkai, who reports a most valuable sign, if substantiated by the test of time. He bases his hypothesis on a very limited number of cases. In these he has found that the normal variation of the pulse rate between the patient lying flat in bed and standing erect, *disappears* early in pregnancy, and in fact may be regarded as an early presumptive sign of pregnancy. When, however, a patient has a heart lesion and the compensation begins to fail, one of the earliest signs will be a return to the normal postural variation met with in the non-gravid. At least it would be interesting to try out this sign and see what it is worth.

Supposing a patient with a history of one or two serious breaks in compensation

comes to us for advice, in the early months of pregnancy. What should our advice be? It would seem to me that the patient should be plainly told of the risk she is running and be given the alternative of having the pregnancy interrupted or taking a fighting chance. Should the patient have no history of breaks in compensation, should she appear in good physical condition, and if her heart presents a double lesion, she should be told that she is running a definite risk, but should also be told that her chances are at least as good as even. However, should the patient have all these favorable signs and evidently be anxious for a child, and present a single lesion,—even if mitral stenosis,—I should be inclined to be optimistic and dwell on the encouraging side of the picture, taking the precaution, however, to point out to her husband that there was a perfectly definite risk involved. My reason for this course would be that, as optimism is such an asset in any pregnancy, it would be unwise not to allow the patient that added chance for a successful outcome. On the other hand, when the patient is considering whether or not it is wise to become pregnant or particularly when a mother of one or more children asks for advice in this regard, whether or not she gives a history of breaks in compensation, the risk should be clearly pointed out to the patient herself in the manner Dr. Newell so emphatically outlines.

The conduct of the case during pregnancy until the last two months are reached will be little more than the rigid enforcement of the hygiene of pregnancy with emphasis on moderation in everything and insistence on close supervision on the part of the physician,—blood pressure and urinalysis every two weeks, with examination of the heart and counting the pulse.

About the end of the 32d week a careful examination should be made with a view to the way and manner in which the patient is to be delivered. This means a careful antepartum examination and a consultation with an internist (preferably one who has had experience in how cardiac cases stand pregnancy and labor), with a view to just how much the heart will stand. This is usually followed by rest in bed under the care of the internist and a course of digitalis to see how the heart responds to that form of stimulation. Now, of course, should the pelvis show a degree of contraction in regard to that particular fetal head which would raise the question as to whether or not that child could be delivered in the normal way, of course pubiotomy or Caesarean section should be considered very seriously as possibilities. However, if the heart had never shown any serious break in compensation, and if it responded well to rest in bed and digitalis, and the disproportion between fetal head and pelvis was slight or lacking, I feel very strongly that the patient should be watched along to see if the head will settle into the pelvis. If that takes place I believe that

the patient should be allowed to fall in labor. When labor starts, if the membranes rupture early, a Voorhees bag should be introduced to hasten dilatation; (this may be done when the membranes are intact if dilatation does not progress rapidly). As soon as full dilatation is reached everything should be in readiness for immediate delivery, and certainly, if the case is that of a primipara, and unless the head immediately crowns in a multipara, the patient should be etherized and the baby extracted with forceps. The patient should be watched very carefully during the post-partum period because these patients are very prone to hemorrhage and because collapse is liable to take place at this time.

However, should the patient have a history of one or more breaks in compensation or should she fail to respond to the digitalis and the rest in bed, what then shall be our treatment of patients where no disproportion exists (or is likely to exist at the end of the 40th week), between the fetal head and the pelvic canal? Remember we are viewing the case eight weeks before the probable onset of labor. We know that the coming weeks are going to be hard on the heart and that the chances are that the patient will be progressively less and less fit to start in labor. That is the real problem!

Our object is to remove the child in the way to safeguard best his interests, without exposing the mother to any more risk than is possible. What courses are open to us? (1) Normal labor. (2) Normal labor until the completion of the first stage, with or without the aid of Voorhees bags, followed by forceps delivery under ether. (3) Abdominal Caesarean section at a time when the chances for the mother and the baby reach a common level (generally speaking, as the days elapse, the chances for the child will increase and the chances for the mother will decrease). (4) Vaginal Caesarean section.

Before discussing the merits and shortcomings of these four avenues of escape, let us see just what pregnancy—especially the last two months—does to the heart.

The heart is pushed upwards and forwards by the increased arching of the cupola of the diaphragm, according to Gerhardt; as a result of this the heart is crowded against the anterior wall of the thorax and the edge of the left lung is displaced. Stengel and Stanton, as we have already stated, refer to the dilatation of the right side of the heart. Newell gives as the symptoms of the strain of pregnancy on the normal heart: limitations of the field of cardiac response when sudden burden is thrown on the heart; dilatation of the right side of the heart occurring during or shortly after labor; a tendency to edema of the lungs in the latter part of pregnancy or during labor; a tendency to overfilling of veins of the legs during pregnancy, resulting frequently in marked varicosities; and

fifth, the occurrence of marked pulsations in the veins of the neck.

This is the effect upon the heart of the later months of pregnancy. How will these symptoms be influenced by the various methods of conducting labor that we have suggested? First, normal labor should never be allowed in a patient who has had symptoms from a chronic endocarditis. The only exception would be a multipara who has such a short second stage that, in spite of adequate preparation, the head crowns before forceps can be applied.

Second, normal or induced labor allowed to go on only as far as full dilatation of the os with everything in readiness for immediate delivery. I believe this to be the treatment for multiparae who have stood pregnancy well. For primiparae, on the other hand, the risk of the prolonged first stage, with its inevitable strain on the heart, as shown by the rising pulse so common with a normal heart, I feel that only where the patient is very young and strong, the cervix soft and the lesion not extensive, should this method be chosen.

Third, abdominal Caesarean section. F. S. Newell, in the *J. A. M. A.*, September, 1912, writes, "If the soft parts are rigid so that it seems probable that the stage of dilatation will be prolonged and exhausting, the substitution of abdominal Caesarean section for the other methods of delivery has very definite advantages and should certainly be considered in the case of a primipara." Again, before the Massachusetts Medical Society in the same year, he says: "Patients with valvular heart disease, particularly mitral stenosis, not infrequently will be more safely delivered by Caesarean section than if allowed to go in labor. This is particularly true of primiparae, whose soft parts are rigid, since the strain of labor on the seriously diseased heart is apt to be followed by a severe and perhaps fatal collapse, and in a patient in whom labor promises to be fairly difficult this risk should not be run, since Caesarean section offers a much safer method of delivery."

Certainly the shortness of the operation, the moderate amount of shock, and the entire absence of fatigue or expulsive strain, would seem to make this operation the ideal one for patients with cardiac disease complicating pregnancy,—added to this is the fact that by Caesarean section the baby is given the very best possible chance. There is another advantage, and that is, with the abdomen opened, the process of sterilization of the tubes, which might often be advisable in the graver cases, could be easily done, with practically no added risk. Why, then, should any other method be considered? Because for the reason that, of all laparotomies, Caesarean section seems most apt to be followed by serious and long continued post-operative distention. Why this is true cannot easily be explained, but all who have had experience with this operation will admit it as a fact. Recently,

to be sure, when all attempts at elaborate pre-operative purging of the intestinal tract have been omitted, there seems a tendency for cases to show less evidence of this complication, so distressing to the normal patient and so alarming to the patient with a cardiac lesion. We have removed the baby to relieve the pressure on the diaphragm, which was endangering our patient's life by pushing the heart so out of place that it could not do its work properly; and by the method we have chosen to accomplish this object we have exposed the patient to an even greater intra-abdominal pressure, which may for many hours more seriously interfere with the proper action of the heart. Of course, where the pelvis is contracted or the walls of the uterus weakened by disease, this will have to be the operation of choice. Otherwise, I feel that it should be employed in cases of cardiac disease only after careful thought has shown that in the individual case, in spite of the risk involved, it offers the best solution of the problem.

Fourth, vaginal Caesarean section. This operation offers certain great advantages over any other method of delivery of a case complicated by a serious cardiac lesion. Of course it must be taken for granted that the pelvis is normal, at least that there is no disproportion between the pelvis and the foetal head. The operation is practically without shock; it is not long; there is no more likelihood of post-operative distention than after a normal delivery; there is no strain on the heart. But, like every other suggested solution, it has its limitations. In the first place, it is difficult, if not impossible, to perform this operation with full-term babies unless they are distinctly smaller than the average. In some cases where the vagina is very small and the cervix is high and points backward, in spite of introducing a bag to pull on and cut against, the operation is so difficult as to be almost, if not quite, impossible. But in the favorable case where, because of the relaxation of the vagina and the uterine ligaments, a good exposure can be obtained, it certainly offers the safest means of emptying the uterus four to eight weeks before term, when the condition of the heart is such that the patient should not tempt fortune by prolonging the strain inevitable during the last weeks of pregnancy.

In speaking of the therapeutic measures to be employed in the treatment of heart disease complicating pregnancy and labor, mention should be made of the value of bleeding in those cases where the heart is overloaded and on the verge of collapse, particularly, immediately after the birth of the child.

CONCLUSIONS.

1. There is no royal road, no accepted path of safety, in dealing with chronic endocarditis as a complication of pregnancy and labor. It is a subject that requires a great deal of study and is worthy of wider discussion.

2. Where the cardiac condition requires that the uterus must be emptied several weeks before term, vaginal hysterotomy, when not rendered impossible by the anatomical limitations, offers distinct advantages over abdominal Caesarean section, particularly because in the former operation there is no post-operative distention.

Medical Progress.

RECENT PROGRESS IN NEUROLOGY.

By JOHN JENKS THOMAS, M.D., BOSTON.

(Continued from page 207.)

SPASTIC PARALYSES.

Gumbel (Zur Behandlung der spastischen Lähmungen mit Foerster'schen Operation, *Berlin. klin. Woch.*, 1914, li, 1353) reporting on the effects of Foerster's operation of resection of the ventral spinal nerve roots for lessening of spasticity in cases of cerebral paralyzes, collects 107 cases of Little's disease from the literature, which have been operated upon. Of these, 14 died, a mortality of 13+ per cent. The writer prefers to do this operation at one stage. He has had eight cases of his own. In his report he omits five of these as not suitable for consideration for one reason or another; one died and one had intercurrent hip joint disease; and of the other three, he states that none learned to walk though careful after treatment was carried out. He concludes that in these cases the muscles are weaker than they appear to be, so that lessening the muscular spasm does not help so much as expected. He also considers that the spine is weakened by laminectomy, as in one of his cases a tendency to curvature was much aggravated, and in two others, previously straight, curvature developed. He concludes that contra-indications for this operation are: first, idiocy; second, athetosis; third, epilepsy; fourth, dislocation of the hip; fifth, marked spasm of the arms; and that even in the remaining cases, better results may be obtained by other methods.

Sharpe and Farrell (A New Operative Treatment of Selected Cases of Cerebral Spastic Paralysis, *Jour. Am. Med. Assn.*, 1915, lxiv, 482) on the other hand, have recently proposed another method of treating the cerebral type of spastic paralysis in children. They report having treated 65 cases by sub-temporal decompression, their first operation being in June, 1913. It should be noted especially that they state that this operation is not to be done in cases where the children are mentally deficient, show constitutional inferiority or idiocy, nor on microcephalic cases, or those in which the spastic paralysis seems to be due to lack of development or malformation of the brain or pyramidal tracts. The writers chose for this operation only cases in which there is a history of a difficult birth, and

those in which ophthalmoscopic examination of the eye showed some definite signs of increased intracranial pressure, such as dilated retinal veins, blurring or haziness of the optic discs. They performed a large right subtemporal decompression. If the pressure is very high and persists, they repeat this on the other side the following week, taking care always to make the opening two to three inches in diameter. One often finds at operation fibrous or cystic formation, which may be removed, punctured or let alone, according to circumstances. The after-treatment has been by the usual methods, orthopedic measures, massage, muscle training. The writers state that 40% of spastic cases show evidence of increased intracranial pressure, which seems exceedingly high. From their cases there were six deaths; four showed only slight improvement; all the others showed greater or less improvement. Further studies of these cases are being carried out.

TIC.

Frof. Emmerich (Ueber erfolgreiche Behandlung der Tic Convulsif durch Chlorkalzium, *Münch. med. Woch.*, 1914, lxi, 2269) gives a review of the literature on the treatment of nervous disorders by the use of salts of calcium. Recent investigations seem to show that the normal functioning of nerve cells is controlled by the calcium content of the nucleus, and that the administration of these salts diminishes the excitability of nerves. Emmerich then reports two cases of severe and prolonged tic convulsif, treated with success by the administration of calcium chloride. One case, in a man of 49, had spasm of the muscles of the neck and arm, averaging forty-five a minute. The duration had been ten years, and the patient was becoming exhausted. Except for potatoes, he seldom ate vegetables, his diet which was ample, consisting mostly of eggs, meat and bread. The calcium content of his diet averaged only 0.721 gm. and the magnesium content was 1.113 gm. A teaspoonful three times a day of 100 parts of calcium chloride in 500 parts of water was given, and in four months there was great improvement, and complete cure in eight months. Another case of spasmodic torticollis from spasm of the splenius capitis gave equally satisfactory results, being entirely cured in five months.

Rohmer (*Monatsschr. für Kinderheilkunde*, 1914, xiii, 205), finding that after the withdrawal of the calcium chloride in cases of spasm, the trouble was apt to return, uses a combination of this treatment with the use at the same time of phosphorized cod liver oil, and thinks his results, in eight cases treated in this manner, confirm this view, based on experimental work of Bisk and Sehabad, who showed that phosphorized cod liver oil has a specific calcium-retaining effect. Rohmer thinks his method gives better results than any other treatment. Generally the spasms stop on the first or second day, and do

not return when the calcium is stopped, and the result seems to be a permanent recovery and not purely symptomatic relief. The electric excitability also falls to normal.

TETANY.

Rosenfeld (Zur Aetiologie der Tetanie, *Arch. für Verdauungskrankheiten*, 1914, xx, 617) reports a case of tetany where the symptoms were apparently due to concentration of the blood. The patient had a cicatricial stenosis of the pylorus and had lost fluids excessively from constant vomiting. When more fluid was allowed to run into the rectum the tetany subsided. The next day it was intended to give 1.5 liters of 0.6 per cent. salt solution intravenously, and 50 gm. of sugar dissolved in water by rectum. By some mistake the sugar was given intravenously in the salt solution and the tetany came on again while this was in progress, but again yielded to more copious intake of fluid, the tetany each time yielding when the deficiency in fluid was made up.

CEREBRAL TUMOR.

Kato (Die Grundlagen der Allgemeinsymptome von Hirntumoren, *Arbeit. a. d. Neurolog., Instit. d. Wiener Univ.*, 1914, xxi, 257) reports a careful study of thirteen cases of brain tumor. He concludes that the clinical phenomena which are considered as general symptoms are in part at least only local symptoms, but produced by the general edema. In relation to this edema, various parts of the brain, especially the various nuclei, possess varying degrees of resistance. Headache he considers due to edema of the meninges, and perhaps also from the hydrocephalus. Vertigo is at least in part explained by marked affection of the region of Deiter's nucleus, and the vestibular nucleus. Vomiting, he thinks, is due to the remarkable sensitiveness of the dorsal vagus nucleus to injury from the tumor. The slowing of the pulse and disturbances of respiration he ascribes to the same cause. The choked disc is due to edema of the optic nerve. For the psychical disturbances he finds no explanation, as alterations of the cells of the cortex are found both when these are present and when they are absent, if we leave aside from psychical disturbances the mental irritability and slight somnolence which are seen in almost all tumor cases.

Alexander and Unger (Heilung eines bemerkenswerten Grosshirn Tumors, *Bert. klin. Woch.*, 1914, li, 1408) report the successful removal of a large encapsulated tumor from the upper part of the posterior central convolution, which was evidently of exceedingly slow growth, with no recurrence in the six months to date of the paper. The only remaining symptom was an astereognosis of the left hand. The tumor was an endothelioma. The remarkable part of the case is that the tumor was removed at one sitting, under local anesthesia. The patient was conscious through the whole operation, even during a whole minute when respiration stopped, and suffered no

pain. The tumor showed well by the roentgen rays.

Mann (Ueber ein neues Symptom bei Kleinhirnhabszess, *Münch. med. Woch.*, 1914, xl, 877) noticed in a child who was deeply somnolent from a cerebellar abscess, that when the nose was pinched, the arm of the unaffected side only was used to push the hand away, and it did not use the arm on the side of the abscess at all, though it was not in the least paralyzed. An other case of cerebellar abscess which was convalescent showed a similar phenomenon, and more noteworthy still, a case of frontal abscess used both hands to defend himself.

SPINAL CORD OPERATIONS.

Taylor and Stephenson (Spinal Decompression in Meningomyelitis, *Jour. Nerv. and Mental Diseases*, 1915, xlii, 1) believe that selected cases of meningomyelitis, in which the segment affected can be determined, should be treated by surgical measures. This consists in laminectomy, free opening of the dura, and probably incision into the posterior columns of the cord. They think the dangers from the operation are small, and that convalescence is hastened and better results are obtained. The operation probably acts by promoting freer circulation, and more rapid absorption of inflammatory exudate, and incision of the cord promotes drainage.

Mauss (Ein Beitung zur chirurg. Behandlung der Rückenmarksgeschwulste, *Münch. med. Wochenschr.*, 1914, lxi, 1451) reports the successful removal of a subdural psammoma which compressed the cord between the eleventh and twelfth thoracic vertebrae. It was chiefly remarkable because of complete cure, after a duration of two years and a half, during a year and a half of which the patient had been paralyzed.

Nonne (Weitere Erfahrungen zum Kapitel der Diagnose von komprimierenden Rückenmarkstumoren, *Deut. Zeitschr. f. Nervenheilk.*, 1913, xlvii, 436) discussed the differential diagnosis of compression of the spinal cord. The older diagnostic methods often left us in doubt, especially as to whether the growth was intra- or extra-medullary. Pain is often absent and also variable in the course of the disease. So dissociation of sensory changes and the absence or presence of localized tenderness to pressure of the spinal column, and the unilateral character of the symptoms often fail us. Oppenheim, Flatau, Burns, and others have increased the difficulty by showing that the same symptoms formerly thought to be diagnostic of tumor are seen also in myelitis, multiple sclerosis and circumscribed adhesive arachnitis. Pain is often absent when the tumor lies dorsally and atrophy of muscles when it is ventral. The spinal fluid seemed to give us a new sign, almost a "compression syndrome", by the increase of globulin with slight or no lymphocytosis, either with or without a yellowish color, to which attention has been called chiefly by French writers, as Froin in

1903. In the past six or seven years, many cases have been reported in which this xanthochromic reaction was absent, and only the increase of albuminoid substances was found, as by Henkel, Nonne, Siemerling, Raven, and others. Nonne concludes that the increase of albumen in the spinal fluid in cases of tumor is probably due to stasis distal to the point of compression and not to inflammation. The following diagnostic points he considers justified:

Isolated increase of albumen in the fluid strengthens the suspicion of compression of the cord.

It is present only distal to the point.

Xanthochromatism of the fluid is due to mixture with blood coloring matter, probably in consequence of hemorrhage.

Increase of cells is probably due to an inflammatory reaction in the meninges.

This syndrome gives no inference as to the character or starting point of the compressing cause.

Finally, a large number of cases show that when everything points to compression, yet laminectomy gives a negative result, still improvement may follow the operation.

Nonne adduces nine extra-medullary and four intra-medullary cases of Elsberg, five cases of Kononova, and adds two of his own.

He states finally that the spinal fluid results do not differentiate intra- and extra-medullary growths.

FAMILY PERIODIC PARALYSIS.

Diller and Rosenbloom (*Arch. of Int. Med.*, 1914, Dec., 769) present a valuable paper giving the clinical history and a metabolism study extending over seven days in a case of periodic paralysis of the familial type. The nitrogen metabolism and urinary nitrogen partition (total nitrogen, urea nitrogen, ammonia nitrogen, uric acid nitrogen, creatinin nitrogen, and undetermined nitrogen), the sulphur metabolism and urinary sulphur partition (total sulphates, inorganic sulphates, ethereal sulphate and neutral sulphur) the calcium, magnesium, phosphorus, and fat metabolism were all studied. The only definite change in the metabolism found was a marked decrease in the amount of creatinin and creatinin nitrogen excreted in the urine, and a marked increase in the amount of undetermined nitrogen in the urine.

THOMSON'S DISEASE.

Johnson and Marshall (*Quart. Jour. of Med.*, London, 1915, viii, 97) report a family in which four members were affected with this disease, three of which they were able to study carefully. Portions of the muscles excised in one case showed the fibres larger than normal, which was due to the increase of fibrillae in each fibre. The nuclei were in proportion to the size of the fibre, showing no relative increase. The striations of the muscles showed normal characteristics. In another case there was no definite change in the

contractions when taken in the morning as compared to those obtained in the evening. Prolonged fixation of a limb increased the abnormal condition in the muscles; after repetition of a movement, though it became quicker, it was also twice as slow as that in a normal person. Reinforcement quickened the first movement of a series, but at the expense of the subsequent ones. Changes in temperature produced no definite changes. On electrical stimulation through the skin weak currents produced brisk contractions and strong ones prolonged spasm. On stimulating the median nerve directly with weak faradism, when the patient was anesthetized, with momentary stimulus contractions lasting fifteen seconds were produced, while the duration was only eight seconds when a strong stimulus was used. After two injections of strychnine the muscular movements were practically normal, and Johnson and Marshall suggest the use of strychnia in this disease.

DYSTONIA MUSCULARUM.

Climenco (Dystonia Muscularum Deformans, *Med. Record*, 1914, lxxvi, 998) reports a clinical case of this puzzling disease. It affected a Jewish girl of 11 whose birth and early childhood were normal, the disease developing after an attack of whooping cough, at the age of 9½, with weakness first in one leg and then the other, and soon tremors affecting both legs and the left hand. The condition progressed and a year later she was unable to walk. The tremor had persisted and affected all the extremities, resembling an athetosis somewhat, but somewhat irregular and worm-like, and entirely lacking in rhythm. There was kyphoscoliosis and on attempting to walk there was torsion of the trunk on the pelvis, flexion of thighs on the trunk, and the knees and feet held at unusual angles with numerous disharmonious movements of the extremities and trunk. The leg muscles and hamstrings were markedly hypertonic and the quadriceps atonic. Similar conditions were present in the hands and arms. The knee jerks and ankle jerks were diminished, and Babinski and Oppenheim's were absent, while the abdominal reflexes were intact. Sensation was not affected nor were the cranial nerves. The intelligence was good.

NERVE SUTURE.

Beckman (Surgical Treatment of Facial Paralysis, *Mich. State Med. Soc. Jour.*, 1914 xiii, 681) from the Mayo clinic reports three cases of anastomosis of the facial nerve in which the point of anastomosis was surrounded with a fresh section of a vein. In these three cases the restoration of function has been more perfect than in one case where the anastomosis was surrounded by fascia and muscle. An inch or more of the facial, external or anterior jugular vein is taken and slipped over the spinal accessory nerve before the anastomosis is made, and after-

wards slipped along until it covers the point of suture. In all four cases the main trunk of the spinal accessory was used with an end to end anastomosis.

Capen (Neue Methode der Transplantation bei Nervendefekten, *Deut. med. Woch.*, 1914, xl, 1894) reports a case where a gap of 12 cm. was left in the ulnar nerve, after removal of a neurofibroma. In order to bridge the gap, the median cutaneous nerve was divided on a level with the peripheral stump of the ulnar. The central stump of the cutaneous was then joined by a perineural suture to the peripheral portion of the ulnar nerve, and following this the central end of the ulnar was sutured to the trunk of the cutaneous nerve. In five weeks the interosseal muscles were active, and in six months the hand could be used practically normally, and sensation had returned to the ulnar side of the hand.

VERTIGO.

Two recent papers by Wilson and Pike (*Vertigo*, *Jour. Am. Med. Assn.*, 1915, lxiv, 561; and *Mechanism of Labyrinthine Nystagmus, and Its Modification by Lesions in the Cerebellum and Cerebrum*, *Arch. of Int. Med.*, 1915, xv, 31) contain the results of recent interesting work upon the cerebral causes of vertigo. They define vertigo as a disturbance of equilibrium, which is the result of disturbances of sensations arising from (1) the ear; (2) the eye; (3) the muscles, tendons and joints; and (4) the skin, which result in disturbances of muscle co-ordination. And yet in tabes we see disturbances of equilibrium without vertigo, so vertigo arises from confusion or dissociation of impulses upon which the subject bases his conception of position in space, and for this the most important are the sense organs in the head segment. Ataxia is due to the loss of a group of afferent impulses; vertigo to disturbance of the normal association of certain groups of afferent impulses, especially those from the head segment. This association is subconscious, yet consciousness may enter in either as a controlling or disturbing element, for example, through memory and emotions. Such a disturbing influence may cause disharmony, and so there arises psychic vertigo. The third and fourth groups of causes do not often cause vertigo; in most instances coming from the ear, with those from the eye next. We also frequently find central vertigo from lesions involving the central paths, as the vestibular path, or the great mechanism of the cerebellum for co-ordinating unconscious sensations from the muscles. The writers were especially impressed in this experimental work with the importance of pressure on the eighth nerve, or in the posterior fossa, but the cause may be in the cortex, in a hyperexcitability of the nervous system. So we get (a) direct vertigo, from lesions of the vestibular apparatus, and (b) indirect, as from gastro-intestinal disturbances.

The authors came to the following conclusions:

1. In labyrinthine disease the patient falls to the side of the lesion, generally in the direction of the slow phase of the nystagmus.
2. The sense of rotation of self is towards the quick phase of the nystagmus.
3. The sense of apparent movement or rotation may persist after, or without nystagmus.
4. Turning the eyes to the side of the slow phase of the nystagmus lessens the vertigo, as the quick phase only can be inhibited, and inhibition of this inhibits the rotary sensation of self and of external objects and diminishes vertigo.
5. In labyrinthine disease the patient lies on the sound side.

Reports of Societies.

BERKSHIRE DISTRICT MEDICAL SOCIETY.

THE Berkshire District Medical Society held a meeting on June 24, 1915, at which the program consisted of a symposium on the heart. The following papers were read:

"The Anatomy and Physiology," Dr. Bruce W. Paddock, Dr. W. L. Tracy and Dr. F. H. Howard.
 "The Abnormalities in Infectious Diseases," Dr. C. S. Chapin.*

"The Abnormalities in Pregnancy," Dr. E. H. Taylor.†

"The Abnormalities in Nephritis," Dr. Henry Colt.

Book Reviews.

Yellow Fever Bureau Bulletin. Supplement Volumes I and II. Liverpool: University Press. 1915.

These two volumes represent the reports received from time to time from investigators working in West Africa under the yellow fever commission appointed by the British secretary of state for the colonies, "to study the nature and relative frequency of the fevers occurring among Europeans, natives and others in West Africa, especially with regard to yellow fever and its minor manifestations." These reports on questions connected with the non-malarial fevers of West Africa are issued under the auspices of the incorporated Liverpool school of tropical medicine.

The reports in the first volume deal with the outbreaks of yellow fever in Nigeria in 1913, in Lagos in 1913 and 1914, and at Guayaquil, Ecuador in 1913. These reports, largely clinical in character, are abundantly illustrated with seven plates, nine plans and maps and 128 charts.

The reports in the second volume deal with a series of 1100 medical pyrexias at Sierra Leone

in 1913, with the work carried on at Freetown in the same year and with various experiments and observations on yellow fever, especially concerning the transmission of the disease to laboratory animals. The reports in this volume are illustrated with twelve plates, one map and 107 charts.

The material in these two volumes constitutes a valuable scientific contribution to the further study of a disease whose etiology is still unknown, although its prophylaxis and clinical control are effectively understood.

Index of Prognosis. By Various Writers. Edited by A. RENDLE SHORT, M.D., D.S., B.Sc., Lond.; F.R.C.S., Eng.; Captain R.A.M.C. New York: William Wood and Company. 1915.

This book, which is issued as a companion volume to the *Index of Treatment and Index of Differential Diagnosis* published by the same firm, aims to coördinate the prognoses of various methods of treatment by a study of their end results and to furnish data on prognosis apart from treatment. Primarily the work has been based on investigation of over a thousand cases from the Bristol Royal Infirmary, where the editor is honorary assistant surgeon and lecturer on physiology. The various subjects are presented by a series of twenty-four contributors, including the editor and other British physicians, surgeons and specialists of distinction. The topics are alphabetically presented, from abdominal injuries to yellow fever, and each item is signed by the author's name. The book is unique and constitutes a contribution of distinct interest and value to medical literature.

A Text-Book of Histology. By RUDOLF KRAUSE. New York: Rebman Company. 1915.

This volume by the professor extraordinary of anatomy at the University of Berlin is translated from the original manuscript and printed only in the English language. It appears as the second part of the author's larger course in normal histology, of which the first part deals solely with the technic of microscopy. The references to illustrations given in the text relate to the colored illustrations contained and published in this larger work. The present volume, which is intended primarily for the use of physicians not particularly interested in technic, is illustrated with a series of thirty-six text figures, three of which are colored. The work forms a valuable, compact exposition of the data of histology with a convenient descriptive emphasis by means of italic and black-faced type. The material is well arranged, and the anonymous translator has done his work satisfactorily. The book should be useful to students as well as to practicing physicians.

* See JOURNAL, page 230.

† See JOURNAL, page 235.

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REGISTRATION OF NURSES IN MASSACHUSETTS.

IN the issues of the JOURNAL for March 5 and 12, 1914, and for February 4, 1915, we published editorials commenting on bills then pending before the Massachusetts Legislature to amend the requirements for nursing in this Commonwealth. There are now pending, before the present session of the Massachusetts General Court, two bills (House Nos. 44 and 1089), presenting alternative propositions relative to the registration of nurses in this State. A comparison of these bills and a discussion of their relative merits seem appropriate.

The first of these bills (No. 44) was presented by Dr. Walter P. Bowers as secretary of the State Board of Registration of Nurses, and embodies the legislation recommended by this board in its sixth annual report covering the

year ended December 31, 1915. These recommendations, therefore, should first be considered.

They are in part as follows:—

"The board unanimously recommends legislation which is amendatory to the existing law. This legislation provides that there shall be two classes of nurses, one, graduates of training schools for nurses able to pass examinations of the board and designated as 'Registered Nurses,' and another class who may be registered without examination upon the endorsement of one physician registered under Massachusetts laws, and two other citizens known to be responsible and of good moral character. Nurses registered under this second provision of this proposed act would be designated as 'Registered Attendants,' and would have the right to practice nursing in this Commonwealth, but could not hold themselves out as graduate nurses.

"This second provision is devoid of technical requirements and should be no hardship on any person desiring to do this work. We trust that it will meet the support of the citizens of the State.

"This carries with it the power of the Board of Registration of Nurses to revoke a certificate and cancel the registration of any nurse for cause. There could be no valid objection to this, because the restrictive provisions of the act would be operative only in cases where gross incompetence or immorality shall have been demonstrated.

The text of the bill submitted by the committee and embodying the recommendations of the board is in part as follows:—

"Section 1. Section three of chapter four hundred and forty-nine of the acts of the year nineteen hundred and ten is hereby amended by striking out all of said section, and inserting in place thereof the following:—*Section 3.* Applications for registration shall be made upon blanks furnished by the board, and shall be signed and sworn to by the applicants. Applicants for registration as graduate nurses who shall furnish the board with satisfactory proof that they are twenty-one years of age or over, of good moral character, and that they have received a certificate of graduation from a training school for nurses shall, upon the payment of a fee of five dollars, be examined, and if found qualified, shall be registered and authorized to use the title Registered Nurse, and shall receive a certificate thereof from the board, signed by its chairman and secretary.

"Applicants for limited registration under this act, who cannot qualify as graduates of training schools for nurses, and who shall furnish the board with satisfactory proof that they are twenty-one years of age or over, and of good moral character, and who are endorsed by three citizens of this Commonwealth known to be re-

sponsible persons of good moral character, one of whom shall be a physician registered in this Commonwealth, shall, upon payment of a fee of three dollars, be registered with the right to use the title Registered Attendant, and shall receive a certificate in testimony thereof from said board, signed by its chairman and secretary.

"Nothing in this act shall be construed as preventing a nurse registered under the title Registered Attendant from filing a new application with the required fee of five dollars, for the purpose of securing the title Registered Nurse, if he or she shall have received a diploma from a training school for nurses as heretofore provided in this section.

"After August first in the year nineteen hundred and sixteen no person shall engage in the work of nursing for hire in this Commonwealth unless he or she has become registered in accordance with the provisions of this act.

"An applicant who fails to pass an examination satisfactory to the board, and is therefore refused registration, shall be entitled within one year after such refusal, to a re-examination at a meeting of the board called for the examination of applicants, without the payment of an additional fee.

"The said board may, after a hearing, by vote of a majority of its members, annul the registration and cancel the certificate of a nurse of either class; and without a hearing may annul and cancel the certificate of a nurse of either class who has been found guilty of a crime or misdemeanor."

Section 2. (This section provides for the salary and compensations to be received by the chairman, secretary and members of the board.)

"Section 3. Section eleven of chapter four hundred and forty-nine of the acts of the year nineteen hundred and ten is hereby amended by striking out all of the text after the word 'gratuitous,' in the first line, and in place thereof inserting the following words:—'or emergency nursing of the sick,'—so that the section as amended shall read as follows:—Section 11. This act shall not apply to gratuitous or emergency nursing of the sick."

This bill may be regarded as representing the expert judgment of the physicians entrusted by the State with the registration of its nurses. Its measures appear not only adequate but reasonable, and it would seem that, under present conditions, at least, it should provide satisfactorily not only for the protection of the community but for the welfare of the nursing profession.

The second of the bills (No. 1089) is presented by the Massachusetts State Nurses' Association as an alternative to the above measure. The bill provides for the amendment of Section 3 of Chapter 449 of the Acts of 1910, which contains the present law relative to nurses' registration,

by striking out the whole of said section and inserting in its place the following:

"Section 3. Application for registration shall be made upon blanks furnished by the board, and shall be signed and sworn to by the applicant. Applicants for registration, under this section, who shall furnish the board with satisfactory proof that they are twenty-one years of age or over, of good moral character, and that they have received a certificate of graduation from a training school for nurses, giving at least two years' training in a hospital and considered efficient by the board, shall, upon payment of a fee of \$5.00, be examined, and if found qualified, shall be registered and authorized to use the title 'Registered Nurse,' and shall receive a certificate thereof from the board signed by its chairman and secretary.

"An applicant who fails to pass an examination satisfactory to the board, and is therefore refused registration, shall be entitled, within one year after such refusal, to a re-examination at a meeting of the board, called for the examination of applicants, without the payment of an additional fee. The said board may, after a hearing, by vote of a majority of its members, annul the registration and cancel the certificate of any nurse; and, without a hearing, may annul the registration and cancel the certificate of a nurse who has been found guilty of a crime or misdemeanor.

"The board shall have authority under this section to investigate at any time the training schools for nurses in this Commonwealth for the purpose of determining their fitness and efficiency, as shown by their general equipment, by the character, the methods, and the extent of instruction given therein.

"For the purpose of conducting this investigation, the board may employ a person legally entitled to R. N. This selection shall be made from names presented by the Massachusetts State Nurses' Association.

"All expenses for such investigation shall be paid by the Commonwealth from the amount received for the registration of nurses. All fees received by the board for the registration of nurses shall be paid once a month into the treasury of the Commonwealth.

"After January one, in the year nineteen hundred, and twenty, no person shall practice as a graduate nurse unless registered by the provision of this act."

As it stands, there seem to be several objectionable features in this second bill. In the first place it appears to lay upon the Board of Registration an undue responsibility for visiting and determining the efficiency of training schools for nurses, and places in their hands an undue power of control over such schools. In the second place it provides that for the conduct of this investigation the board may employ a registered nurse, but only a nurse selected from a list of

names submitted by the Massachusetts State Nurses' Association. This virtually gives to the Association the selection of an investigating nurse. There are in Massachusetts today approximately 6,000 registered nurses, and it seems hardly fair to place in the hands of a body of only about 700 members the power to dictate the selection of a representative from so large a number. In the third place, this bill in its concluding paragraph provides that after a certain date no person shall practice as a graduate nurse unless also a registered nurse. This definition of the term "graduate nurse" is uncertain, nor is it clear that the prohibition of all practice except by registered nurses is at present judicious or will become so by the date named.

All things considered, it would appear that the first of these two bills, which is not open to the objections advanced against the second, is preferable and should be enacted into law, since it will supply the changes in the present statute relative to the registration of nurses which are agreed by the advocates of both bills to be desirable. The hearing by the legislative committee on Bill No. 44 has already been held, but action on it has been deferred until after the hearing on Bill 1089, which will probably occur some time during the current week. Physicians are reminded that these bills affect their interest and the welfare and progress of medical practice as much as they do those of the nursing profession. They are urged, therefore, carefully to scrutinize these proposed measures and, after reaching a decision, to attend the hearing, if possible, and at least, by correspondence with their representatives and senators, to indicate their opinion and preference.

MEDICAL SOCIAL WORK AT THE BOSTON CITY HOSPITAL.

IN another column of this issue of the JOURNAL we publish a statement by Miss Farmer of the medico-social work done by her department during the first year of its establishment at the Boston City Hospital. The importance of this branch of hospital activity has been abundantly demonstrated since its original establishment at the Massachusetts General Hospital ten years ago. Nine years ago the same work was inaugurated at the Bellevue Hospital in New York, and has since been adopted by other institutions.

Miss Farmer was connected from the outset with the Social Service Department at the Massachusetts General Hospital, and when it was desired to establish a similar service at the Boston City Hospital, her expert services were secured as director.

The establishment of the medical social work at the Boston City Hospital was undertaken by a private committee of charitable ladies, who assumed the financial responsibility for it for a limited time, under the leadership of Mrs. Paul Thorndike. The first meeting of this committee was held on March 14, 1914, and in October the department was opened under the direction of Miss Farmer. In November, 1914, another worker was secured and a number more have subsequently been added. Even so, the number employed can deal with but a small proportion of the patients needing some form of medical social service.

As is well shown by Miss Farmer's report, the success of the department was immediate and unquestioned. If such an expansion of its activities took place in its first twelve months, under all the difficulties and discouragements which attend the establishment of any undertaking in its experimental stages, it is obvious how much more may be accomplished in succeeding years with adequate funds and well organized plans.

The value of medical social work, is not only to the patients, in the advice and actual assistance which they receive, but also to the medical and surgical staff in the help afforded by following up patients beyond the hospital limits, and thereby greatly increasing the likelihood of permanent benefit from treatment and of the prevention of further sickness. The professional staff of the City Hospital has, of course, recognized the scientific, as well as the humanitarian, values of social service and should be among the foremost to desire the possibility of its continuance in the Boston City Hospital. The time is rapidly drawing near when the pecuniary support of this work can no longer be left entirely to private enterprise. Its importance for the best efficiency of the hospital and for the welfare of patients is so clearly recognized by the profession and by the public that the hospital staff may confidently be expected to recommend, and the trustees to make provision for, its future maintenance and extension.

CARDIAC DISEASE IN PREGNANCY.

THE attention of readers is called to the report, which appears in this issue of the JOURNAL, of a meeting of the Berkshire District Medical Society, at which the papers presented constituted a symposium on the heart. Two of these papers, on abnormalities of the heart in infectious diseases and in pregnancy, are also published in this issue. It is our plan in the future to present as frequently as possible similar brief reports of meetings of the various district societies and, so far as practicable, to publish the papers presented.

In conjunction with the paper by Dr. Taylor on "Abnormalities of the Heart in Pregnancy," we are publishing also a paper by Dr. Huntington on "Heart Disease in Pregnancy and Labor," as appropriately belonging with this symposium. The subject of cardiac disease in pregnancy, as both authors point out, is one of great importance and one which has not received in the past the attention which it deserves. Opinions differ widely, according to the temperament and experience of the physician, as to the desirable methods of dealing with the various forms of cardiac disease during pregnancy and labor. We desire to call particular attention to the presentation of some of these opinions by Dr. Taylor and Dr. Huntington, and to express the hope that their articles may stimulate further discussion of the subject in these columns.

MEDICAL NOTES.

NATIONAL COMMITTEE FOR MENTAL HYGIENE.

—At the eighth annual meeting of the National Committee for Mental Hygiene, held recently in New York, Mr. Otto T. Bannard, the treasurer, announced that the Rockefeller Foundation had donated to the national committee \$22,800 for carrying on its surveys of the care of the insane in sixteen states during the year. Surveys of South Carolina and Texas have been completed, and in California, Tennessee, Missouri, Illinois, North Dakota, Indiana and the District of Columbia surveys are now under way or about to be undertaken. The following officers were elected for the ensuing year:

President, Dr. Lewellys F. Barker; vice-presidents, Dr. Charles W. Eliot and Dr. William H. Welch; treasurer, Otto T. Bannard; medical director, Dr. Thomas W. Salmon; secretary, Clifford W. Beers; executive committee, Dr. August Hoch (chairman), Dr. George Blumer, Professor Stephen P. Duggan, Dr. William Mahon, Dr. William L. Russell and Dr. Lewellys

F. Barker; finance committee, Professor Russell H. Chittenden (chairman), Otto T. Bannard, Dr. Henry B. Favill and William J. Hoggson; committee on mental deficiency, Dr. Walter E. Fernald (chairman), Dr. L. Peirce Clark, Professor E. R. Johnstone, Dr. C. S. Little and Dr. A. C. Rogers.

A MEDICAL CONGRESS.—There was held in Chicago, on February 7 and 8, a joint meeting of representatives of the Federation of State Medical Boards of the United States, the Association of American Medical Colleges and the councils on medical education and on health and public instruction of the American Medical Association. The first meeting of the congress was the twelfth annual conference of the council on medical education. The program consisted of a symposium on the relation of the laboratory courses to the work of the clinical years, with addresses by Dr. Lewellys F. Barker of Johns Hopkins University, Dr. James Ewing of Cornell University Medical College, New York City, and Dr. Frederic S. Lee of Columbia University College of Physicians and Surgeons.

Later in the day the council held a joint session with the State boards, and heard Surgeon Generals W. C. Gorgas of the army, W. C. Braisted of the navy, and Rupert Blue of the public health service discuss the National Board of Medical Examiners in its relationship to the federal medical services. In addition, Dr. Herbert Harlan, president of the Maryland State Board of Medical Examiners, presented ideas as to the relationship of the national board with the various state bodies. These talks were followed by technical papers by Dr. Victor V. Vaughan, dean of the University of Michigan Medical School, and Dr. Isadore Dyer, dean of the Tulane University School of Medicine, at New Orleans. Dr. Charles V. Chapin, Commissioner of Health of Providence, R. I., submitted a report of his investigations of health departments of various cities. Under his perfect system of rating, a perfect score of 1000 points was distributed among the following heads, which were in turn subdivided: Supervision of local health officers; communicable disease, tuberculosis, diagnostic laboratory, vital statistics, child hygiene, education, food, general sanitation, and control of water and sewage.

On this basis Massachusetts had a score of 745; New York, 730; Pennsylvania, 716; Minnesota, 570; New Jersey, 555; Indiana, 526; Maryland, 507; Kansas, 499; Vermont, 486; Ohio, 462; Illinois, 346.

MEDICAL PREPAREDNESS.—The remarks of Dr. W. C. Gorgas, surgeon-general of the United States Army, before the medical congress held in Chicago, February 7 and 8, are worthy of emphasis. He stated that the United States would, in a few years, have an army of one million men ready to take the field, and to meet the requirements of this vast body of men at least 10,000 surgeons will be required.

Dr. Gorgas urged the adoption of a proposal offered earlier in the day for a national conference of medical examiners, composed of representatives of state medical examining boards, which would prepare examination questions for State boards throughout the country. Candidates who passed this examination would be eligible for the United States Medical Reserve Corps and would not have to pass any other examination for licenses to practise. Should the plan be adopted, Dr. Gorgas said, it would place the United States in a condition of preparedness, from a medical standpoint, unexcelled by any nation; each surgeon would be instructed in field duties, camp sanitation, and the proper foods to be given out in various climates.

SICKNESS INSURANCE.—In connection with the present contemplated legislation in this state to establish a system of health insurance for industrial workers, it is interesting to note the plan of federal sickness insurance advocated by Dr. Otto W. Huffman at the recent medical congress held in Chicago. Dr. Huffman stated that his plan contemplated a tax of \$2.00 a year on all wage earners whose income is less than \$1200, of which he estimates there are 33,000,000 in the United States. Each would have the privilege of selecting his own doctor, but no physician would be allowed to carry more than 2,000 names. Dr. Huffman further stated in part:

"This would mean \$4,000 a year for treating those that become sick or disabled and statistics show that not more than sixty of these would ever be sick at the same time.

"In general, the public does not realize how miserably underpaid the medical profession is. There are 127,000 active practitioners in the country and their incomes aggregate \$63,500,000, an average of only \$500 a year. Nor is it true, as has often been stated, that 'there are too many doctors.' About two and one-half per cent. of the population is constantly sick and disabled, an average of 19 patients a day for each doctor. This does not take into account much of the practice of specialists. Furthermore, insurance company statistics show that 69 per cent. of the insured have some impairment of health.

"Under compulsory insurance, we should be paid to keep our clientèle in sound health, and it would be against our interest to have sickness occur. When the medical profession is paid to prevent sickness and is a loser when anyone becomes sick, the day of the quack and the charlatan will be past."

TUBERCULOSIS IN JAPAN.—Report from Tokyo on December 30, states that Dr. Shibasaburo Kitasato has recently published important and striking statistics of the distribution of tuberculosis in Japan. The death rate from this disease in the entire country is 17 per 10,000, but this rate is considerably exceeded in certain occupations. Among school teachers in particular, the annual death rate from tuberculosis is 24 per thousand. Another class in which the incidence of the disease is particularly high is that of factory girls, of whom there are 500,000 in Japan. Among this class there is an average of 9000 deaths a year of which 6300 are from tuberculosis.

"Most of the factory girls live in dormitories. Space is at a premium in these dormitories, usually six feet square for three girls. In many instances two girls are required to sleep in one bed. Then, again, the girls are usually divided into two shifts. The girls of the night shift sleep in the day time and work at night. The girls of the day shift return and enter the very beds just vacated. No opportunity to air the bedding is given."

Further factors in the prevalence of tuberculosis in Japan are the construction of houses in low areas where the sun rarely enters, and the primitive habit of tightly closing windows and doors during the night.

INCREASE IN COST OF DRUGS.—Since the beginning of the New Year the increase in cost of many drugs owing to disturbance of the market by the European War has in the main continued, though certain commodities have shown a slight downward tendency. Report from New York on January 26 refers particularly to the rise in cost of opium and antipyrine.

"After a period of comparative inactivity, opium furnished the surprise of yesterday's trading, the quotation on gum opium going from \$11, at which point it had been maintained since before January 1, to \$12.50, and on powdered opium from \$12.25 to \$12.50. This is a high record for nearly fifty years for this product. The market position of this product is further strengthened by the probability that with Greece's entrance into the war on either side, supplies from Turkey will be completely cut off. Already there has been noted an increasing difficulty in obtaining opium from this source. Previous to the war, opium sold here at \$7.45, so that the advance during hostilities has amounted to approximately 90 per cent. Trade factors predict a further rise in price, as the supply in hand diminishes.

"Among the drugs, antipyrine has recently been the leader in the upward price movement. A little more than a year ago this product could be purchased at \$2.50 a pound, whereas \$50 is now asked. This represents a \$20 increase over the ruling quotation on January 1 of this year.

Antipyrène is not produced in this country, and the United States is chiefly dependent upon Germany for its supply. Some shipments have been received by American importers through arrangement with the British and German governments, but this practice has recently been checked. Antipyrène is used principally in medicinal compounds, particularly in combination with aspirin, and the demand due to the epidemic of grip has exhausted stocks here. While the local supply is very small, importers explain the high prices as the result of speculation. Sales at \$75 are anticipated in the trade.

"Among the drugs and chemicals the prices of which have fallen recently are glycerine, carbolic acid and menthol."

INAUGURATION OF FORCHHEIMER CHAIR OF MEDICINE.—The formal inauguration of the Frederick Forchheimer professorship of medicine at the University of Cincinnati and the installation of Dr. Roger Sylvester Morris as first professor were held in Cincinnati, Ohio, on January 28, under the presidency of the Honorable Bellamy Storer. Addresses were delivered by Mr. Storer, by Mr. C. W. Dabney, president of the University and by Dr. Christian R. Holmes, dean of the Medical College. President Dabney recounted and eulogized the work of Dr. Forchheimer. Dr. Morris delivered his inaugural address on "Precision in Medicine," saying in part of the recent advances in medicine and surgery:

"It is safe to say that there is not a family in an enlightened community at the present day which does not owe a very real and personal debt of gratitude to Louis Pasteur. All the advance we have recorded in preventive medicine, in vaccine or immune therapy, is traceable to his illuminating researches.

"Could the honest anti-vivisectionist, accosted as he is to the benefits of preventive medicine and of specific therapy (resulting possibly in the saving of his baby's life through diphtheria antitoxin), could such a one, I say, be made to live a year of his life under conditions which existed fifty years ago, the community, perhaps, devastated by a mysterious pestilence, or himself, perchance, the victim of perforative appendicitis, for which nothing could be done, he would have fresh food for thought and would acquire, possibly, a new and truer understanding of the word 'humanity,' not only in its application to dumb animals but even to man."

PREVALENCE OF MENINGITIS, POLIOMYELITIS, SMALL-POX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for January 28 states that during the month of December, 1915, there were, in Ohio, 17 cases of cerebrospinal meningitis, 16 of poliomyelitis, 229 of small-pox, and 354 of typhoid fever. During the same period there were 81 cases of small-pox and 96 of typhoid in Michigan; and in

Minnesota, 197 cases of small-pox and 77 of typhoid. There were 246 cases of small-pox in Wisconsin and 202 of typhoid fever in Louisiana.

NEW CHILDREN'S CLINIC RECORD CARD.—One of the most promising developments of the Tuberculosis Clinic service throughout New York City has been the establishment of special children's classes. These classes are designed to care not only for the children patients of the Clinic but also the children of the Clinic's adult patients—those who are known to have been exposed to infection. In these classes, which are held on Saturday morning, every effort is made to carry out preventive measures and to secure for all the children proper disposition either in preventoria, sanatoria, or open-air school rooms. An important feature of the Children's Clinic work has been the courses in physical exercise inaugurated at the Chelsea Clinic by the Society for Prevention and Relief of Tuberculosis, and subsequently introduced into other clinics through the coöperation of the Department of Education. The classes have been so well attended and have been so beneficial in improving or maintaining the good health of the children and holding their interest in the Clinic that it is hoped it may be possible to extend these classes to other clinics. During the coming year, it is proposed to carry on, simultaneously with these classes, a control class for the purpose of comparison. It is confidently expected that not only will great benefit accrue to the children, but that interesting statistical data will presently be available.

DEFINITION OF DIABETIC FOODS.—The United States Department of Agriculture has recently issued, for the guidance of officials of the Department in enforcing the Food and Drugs Act, a decision (No. 160) fixing a definite limit to the amount of starch and sugar that may be present in certain gluten products and diabetic foods, and also fixing the amount of nitrogen that must be present in certain of these products, and making requirements as to moisture and other constituents. The decision covers ground gluten, gluten flour, self-rising gluten flour, and "diabetic" foods. The definitions and standards as stated in the Food Inspection Decision were recommended by the Joint Committee on Definitions and Standards, consisting of representatives of the United States Department of Agriculture, the Association of American Dairy, Food and Drug Officials, and the Association of Official Agricultural Chemists. These two associations have already adopted the definitions and standards.

Investigations by the officials in charge of the enforcement of the Food and Drugs Act have shown that various food products have been placed on the market from time to time that are recommended by the manufacturers for use by

people suffering from diabetes. It is generally held that the foods best suited to persons suffering from diabetes are those which contain little or no starch and sugar. Some of the foods placed on the market and recommended by the manufacturers for use in diabetes have been found to contain nearly as much starch and sugar as ordinary products, so that they were of no more value in the treatment of diabetes than ordinary food products that could be purchased more cheaply. The diabetic patient can avoid ordinary food products that contain considerable quantities of starch and sugar, as the composition of these products is generally known. In the case of prepared foods, advertised for use in diabetes, however, the patient may be misled into eating quantities of starch and sugar that might be positively injurious.

EUROPEAN WAR NOTES.

CHOLERA IN AUSTRIA-HUNGARY.—The weekly report of the United States Public Health Service for February 4, 1916, states that during the three weeks ended November 29, 1915, there were in Austria 115 cases with 43 deaths of Asiatic cholera; in Croatia-Slavonia, 72 cases with 22 deaths; and in Hungary, 9 cases with 8 deaths.

A HOSPITAL UNIT FROM NOVA SCOTIA.—Report from Antigonish, Nova Scotia, on February 9, states that the University of St. Francis Xavier in that city, has offered to send to Europe for service in a British military field hospital, a unit, to consist of twelve surgeons, forty nurses, and 150 assistants. This offer has been accepted by the military department at Ottawa and authorized by the Imperial Council in England. It is expected that the unit will sail for Europe in April.

WAR RELIEF FUNDS.—On February 12 the totals of the principal New England relief funds for the European War reached the following amounts:—

Jewish Fund	\$113,657.49
Belgian Fund	95,956.71
Serbian Fund	78,122.98
Allied Fund	60,689.80
French Wounded Fund	45,940.33
British Fund	46,724.70
American Ambulance Fund ..	74,161.58
Armenian Fund	33,418.60
French Orphanage Fund	25,758.25
Surgical Dressings Fund	19,019.00
Polish Fund	20,258.56
La Fayette Fund	18,261.99
German Babies' Milk Fund ..	1,166.80

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending February 12, there were 266 deaths reported, with a rate of 18.24 per 1,000 population as compared with 253 and a rate of 17.63 for the corresponding week of last year.

There were 4 deaths from influenza. Deaths from pneumonia and broncho-pneumonia numbered 48 against 24 last year.

There were 46 deaths under 1 year as compared with 39 last year, and 73 deaths over 60 years of age against 85 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 50; scarlet fever, 64; measles, 102; typhoid fever, 3; whooping cough, 53, and tuberculosis, 70.

Included in the above were the following cases of non-residents: Diphtheria 3; scarlet fever, 7, and tuberculosis, 11.

Total deaths from these diseases were: Diphtheria, 5; scarlet fever, 1; measles, 3; whooping cough, 2, and tuberculosis, 30. Included in these were the following non-residents: Diphtheria, 1 and tuberculosis, 1.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JANUARY, 1916.—There was a large increase in the total number of cases of communicable diseases reported in the month of January, 1916. During the month of January, 1915, there were 6,156 cases reported to this department, while during the month just closed, there were 7,626 cases reported. In comparison with the month of December, 1915, there was an increase of 2,224 reported cases of communicable diseases. This great increase of communicable diseases has been due to the greater prevalence of measles, scarlet fever, whooping cough, diphtheria and tuberculosis.

The striking feature of the January mortality returns is the number of deaths from diphtheria, measles, scarlet fever and whooping cough.

Diphtheria continues to take its enormous toll of lives. The fact that there were 84 deaths during the month just closed should call our attention to a renewed effort to overcome this disease. The fatality rate has been 8.0. This is not an unusually high rate for this disease.

Measles and whooping cough have caused 49 deaths during the month. The public and even a great many physicians still persist in classifying these two diseases as "harmless." When you consider that over three per cent. of the whooping cough cases and almost one per cent. of the measles cases were fatal last month, it does not seem to require any further comment. The subject of the control of these two diseases is a very live public health problem. All public health workers should coöperate in working out some rational method to control these diseases.

Scarlet fever did not cause as many deaths during January as it did the same month last year, but it did cause almost four times as many deaths last month as it did during the month of December, 1915. This does not give us any index to the amount of damage done to the 1,160 persons who suffered from this disease during January, for very often the after effects of scarlet fever are much more serious than the disease itself.

Typhoid fever continues to show a very high fatality. While there was a decrease in the number of cases last month, 18 deaths were reported. This makes a fatality rate of 16.1, which is a very high rate.

The increase in the number of cases of the various diseases noted above is interesting. Measles, scarlet fever, whooping cough, diphtheria and typhoid fever have been present in unusual amounts in various cities and towns. Tuberculosis reports are beginning to show distinctly the effect of dispensaries. During January, 1916, there was an increase in reported cases over the same month last year of 230.

Measles has been epidemic in various parts of the state. In Chelsea, Dennis, Lynn, Saugus and Winthrop it has been particularly prevalent, while Canton, Wrentham, Lawrence, Webster are having an unusual number of cases.

Scarlet fever has been present in unusual amounts in the following cities and towns: Cambridge, Dedham, Hingham, Milton, Quincy, Lynn, Arlington, Medford, Methuen, Worcester, Leominster, Northampton and Springfield.

Whooping cough is present in almost every part of the state. Some of the cities and towns where it is most prevalent are as follows: Mansfield, Cambridge, Melrose, Winthrop, Andover.

Diphtheria has been more prevalent in some places during January than it was in December. Many of the reported cases are not in persons ill with the disease, but are "carriers" detected during the course of routine examination. Diphtheria remains an important factor in the morbidity reports from the following cities and towns: Lawrence, Lowell, Somerville (on account of its fatality), Leominster and Springfield.

Typhoid fever was not reported in unusual amounts from any particular part of the state. The interesting thing about this disease during the month was the fact that it had an unusually high fatality. One hundred and twelve cases were scattered through various parts of the state and caused 18 deaths.

Measles and whooping cough have been epidemic in a number of places. The State District Health officers have investigated a number of these outbreaks, and in almost every case it has been shown that the disease was spread through the medium of the public school. Material is being collected for a study of these two diseases, with a hope that we may be able to suggest a rational plan of controlling them.

During the month there have been two cases of trichinosis reported, one from Worcester and one from Brockton. A single case of actinomycosis was reported from Lowell. This city also had the distinction of reporting the single case of smallpox in the state. The case was imported from Canada.

RHODE ISLAND HOSPITAL.—The fifty-second annual report of the Rhode Island Hospital gives the following statistics: Patients admitted during the year, 7,647. These, with the 374 patients remaining in the hospital October 1, 1914, make a total of 8,021 patients treated during the year. The average stay in the hospital of each patient treated during the year was 15.92. As indicative of development of methods of treatment it is interesting to note the average stay of patients in this hospital at intervals of ten years: For the year 1875 the average stay was 43.00 days; 1885, 41.00 days; 1895, 25.34 days, and 1905, 21.11 days. Nearly 7,000 radiographs were taken in the X-ray Department during the past year. The Crawford Allen Memorial Hospital which has shown good results in the treatment of children during the summer months, will be kept in operation during the winter by reason of a gift of Mr. Stephen O. Metcalf of \$6,000.

APPOINTMENT OF DR. SCANNELL.—At a recent meeting of the Boston School Committee, Dr. David D. Scannell of this city was elected its president for the ensuing year.

BROOKLINE TUBERCULOSIS HOSPITAL.—On February 5 the new Brookline Tuberculosis Hospital was first formally opened for inspection and a reception was held by the hospital staff to the state trustees of hospitals for consumptives and to other invited guests. An address was made by the chairman of the Brookline selectmen.

"The hospital has been erected at an approximate cost of \$38,000, from plans which include also a central heating and lighting plant for the hospital, the contagious building and the almshouse.

"In exterior finish, the hospital is of limestone, with two stories in the centre, and two one-story wings. The second floor is a hall for nurses, who will have also outdoor sleeping quarters. The first floor contains two wards of eight beds each, four private rooms, dining room, recreation room, kitchen and office. The inclusive exterior dimensions are 35 by 120 feet. Covered and uncovered porches surround the building, and direct sunlight may be had through the south wall, much of which is of glass. Skylights also are arranged so that the sun's rays may shine directly upon the patients' beds.

"Fresh air, which is driven through the building, is first sent through a heating chamber. There is a silent-call system, by which a patient, by the push of a button, shows a light over his bed and in the hall and office. The general lighting system is indirect and on two circuits—one for lighting a ward only partly, and the other for throwing on a full light."

Massachusetts Medical Society.**STATED MEETING OF THE COUNCIL.**

A STATED meeting of the Council of the Massachusetts Medical Society was held in John Ware Hall, Boston Medical Library, Wednesday, February 2, 1916, at 12 o'clock noon. The president, Dr. Charles F. Withington, was in the chair and the following 72 councilors present:

BERKSHIRE.	NORFOLK.
J. H. Riley.	M. V. Pierce.
	E. H. Brigham.
BRISTOL NORTH.	A. N. Broughton.
Sumner Coolidge.	G. W. Kaan.
	Bradford Kent.
BRISTOL SOUTH.	Joseph Kittredge.
W. A. Dolan.	W. H. Robinson.
R. W. Jackson.	E. P. Starbird.
H. G. Wilbur.	
ESSEX NORTH.	NORFOLK SOUTH.
R. V. Baketel.	C. S. Adams.
T. R. Healy.	
G. E. Kurth.	PLYMOUTH.
E. H. Noyes.	A. E. Paine.
F. W. Snow.	F. G. Wheatley.
ESSEX SOUTH.	SUFFOLK.
G. M. Kline.	J. D. Barney.
C. H. Bangs.	E. S. Boland.
R. E. Bicknell.	H. I. Bowditch.
N. P. Breed.	G. W. W. Brewster.
	E. M. Buckingham.
FRANKLIN.	W. L. Burrage.
G. P. Twitchell.	H. A. Christian.
	A. L. Chute.
HAMPDEN.	E. A. Codman.
J. M. Birnie.	J. A. Cogan.
M. B. Hodskins.	E. G. Cutler.
	Albert Ehrenfried.
MIDDLESEX EAST.	C. M. Green.
C. J. Allen.	J. B. Hawes, 2d.
W. H. Keleher.	W. C. Howe.
	J. L. Morse.
MIDDLESEX NORTH.	Abner Post.
C. E. Simpson.	Anna G. Richardson.
	R. M. Smith.
MIDDLESEX SOUTH.	H. F. Vickery.
Albert August.	C. F. Withington.
M. H. Bailey.	
H. T. Baldwin.	WORCESTER.
F. E. Bateman.	F. H. Baker.
C. H. Cook.	W. P. Bowers.
H. F. Curtis.	David Harrower.
A. A. Jackson.	G. O. Ward.
S. F. McKeen.	C. D. Wheeler.
C. E. Mongan.	S. B. Woodward.
Godfrey Ryder.	
E. H. Stevens.	WORCESTER NORTH.
Julia Tolman.	E. A. Sawyer.
C. T. Warner.	

The reading of the minutes of the last meeting was dispensed with as they had been printed in full in the JOURNAL and had been sent to every Fellow.

The reports of the committees appointed to consider the petitions of J. J. Sullivan, of Lawrence, and O. M. Deems, of Springfield, for restoration to the privileges of fellowship were read and accepted, and it was voted that they be restored on the usual conditions. Three peti-

tions for restoration were read, and the following committees were appointed to consider them:

E. H. Ferguson:	G. W. Winchester, L. S. McQuade, T. E. Guild.
Joseph Shehan:	W. C. Howe, Percy Brown, R. B. Osgood.
G. W. Ellison:	A. F. Peck, Alexander McNeish, J. C. Austin.

The president nominated and the Council elected these delegates and alternates to the House of Delegates of the American Medical Association for a term of two years from June 1, 1916:

Delegate, J. B. Blake.	Alternate, Gilman Osgood.
" H. G. Stetson.	" L. A. Jones.
" L. F. Woodward.	" J. F. Burnham.

In the same manner, W. P. Bowers, of Clinton, was appointed a delegate to the Annual Congress on Medical Education, Public Health and Medical Licensure, at the Congress Hotel, Chicago, February 7 and 8, 1916, also these delegates to the annual meetings of state medical societies:

VERMONT:	I. J. Clarke, Haverhill; A. D. Bush, Burlington, Vt.
CONNECTICUT:	A. J. Abbe, Fall River; S. A. Lord, Cromwell, Conn.
NEW HAMPSHIRE:	P. P. Johnson, Beverly; H. K. Faulkner, Keene, N. H.
MAINE:	C. H. Bangs, Lynn; S. W. Allen, York Harbor, Maine.
RHODE ISLAND:	Godfrey Ryder, Malden, W. L. Munro, Providence, R. I.
NEW JERSEY:	To the one hundred and fiftieth anniversary of the founding of the Society, July 23, 1766: L. M. Palmer, Framingham; R. H. Ferguson, East Orange, N. J.

The treasurer read his report for the year 1915, and the secretary read the following report of the Auditing Committee:

"BOSTON, January 28, 1916.

"The undersigned, a duly appointed committee, having examined the books of the Treasurer, find them correctly cast and properly vouched, and also that he has in his possession the securities called for.

"EDWARD O. OTIS,
"WILLIAM H. ROBEY, JR."

Voted, To accept the reports and place them on file.

Dr. J. D. Barney reported for the Committee of Arrangements, stating that the committee have prepared plans for holding the annual meeting in the Copley-Plaza Hotel, Boston, as last year, sketching the details and asking for suggestions from the council. There were no suggestions and no discussion.

Dr. Green presented this report on membership and it was accepted and its recommendations adopted by vote:

The Committee on Membership and Finance makes the following recommendations as to membership:

1. That the following named Fellows be allowed to retire, under the provisions of Chapter I, Section 5, of the by-laws:

Carleton, Charles Greenleaf, of Lawrence.
Fisher, Chester Irving, of New York.

3. That the following named Fellows be allowed to resign, under the provision of Chapter I, Section 7, of the by-laws:

Bianco, Joseph Anthony, of East Boston.
Cain, William George, of Nashua, New Hampshire.
Clark, James Colby Dorr, of Medford.
Johnson, Herbert Shattuck, of Malden.
Kelley, Michael, of Fall River.

Langnecker, Harry Leslie, of San Francisco, Cal., to take effect March 1, 1916.

Laws, Sophie Goudge, of Spartanburg, South Carolina.

Nagle, Evelyn Wyman, of Boston.
Parker, Albert Munro, of Santa Maria, California.
Quennell, Willard Leslie, of Lynn.
Smith, Theobald, of the Rockefeller Institute, Princeton, N. J.

Vosburgh, Stephen Earle, of Augusta, Maine.
Williams, Harry Edwin, of Mount Vernon, Maine.

4. That the following named Fellows be allowed to change their district membership, without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws:

Boutwell, Horace Keith, from Norfolk to Suffolk.
Rowditch, Henry Ingersoll, from Norfolk to Suffolk.
Chamberlain, Myron Levi, from Essex South to Suffolk.

Hartwell, John Bryant, from Norfolk to Suffolk.
Marshall, Herman Weston, from Norfolk to Suffolk.
Pratt, Joseph Hersey, from Norfolk to Suffolk.
Richardson, Frank Linden, from Norfolk to Suffolk.
Robbins, Chandler, from Middlesex South to Suffolk.
Walker, Clifford Black, from Suffolk to Norfolk.
Walker, Irving James, from Middlesex South to Suffolk.

Wernick, Ben Zion G, from Norfolk to Suffolk.

For the Committee on Membership and Finance,
CHARLES M. GREEN, *Chairman*.

Dr. Green presented the accompanying report on finance for the Committee on Membership and Finance, and it was accepted and its recommendations adopted:

The Committee on Membership and Finance makes the following recommendations as to Finance:

1. That a dividend of \$4000, from the balance remaining in the treasury on December 31, 1915, be apportioned among and paid to the district societies, in accordance with the provisions of Chapter VII, Section 3, of the by-laws:

2. That appropriations for Standing Committees for the financial year 1916 be made as follows:

For the Committee of Arrangements.....	\$2900
For the Committee on Ethics and Discipline....	25
For the Committee on Medical Education and Medical Diplomas.....	50
For the Committee on State and National Legislation	250

3. That to make possible the continuance of the affiliation of this Society with the BOSTON MEDICAL AND SURGICAL JOURNAL, the Council appropriate for the year 1916 the sum of \$9500, this sum to be reduced by such amount as may be raised by special subscription.

4. That the Advisory Committee representing the Massachusetts Medical Society on the Board of Management of the BOSTON MEDICAL AND SURGICAL JOURNAL be authorized by the Council to secure pledges towards the maintenance of the JOURNAL.

For the Committee on Membership and Finance,
CHARLES M. GREEN, *Chairman*.

Dr. C. H. Cook read the following proposed amendment to Chapter IV, Section 1, of the by-laws, and action on it was postponed until the annual meeting of the Council, in June:

Chapter IV, Section 1.

In the second line after the word, "president" insert the word, "ex-presidents", and in the third line omit the word "and", and after the word "treasurer", insert the words, "and librarian", so that the section shall read as follows:

Section 1. The Council shall consist of councillors chosen by the district societies, and the president, ex-presidents, vice-president, vice-presidents *ex officio*, secretary, treasurer and librarian of the general society, and the chairman of each standing committee.

At the request of the president the secretary read a letter from Dr. Joseph C. Bloodgood, secretary of the American First Aid Conference, on the importance of the subject of First Aid, and on nomination by the president the following committee was appointed to represent the Massachusetts Medical Society as a First Aid Committee:

F. B. Lund, J. B. Blake, R. P. Strong.

Dr. Abner Post read the following resolutions on the death of Dr. James Clarke White, on behalf of a committee appointed by the president:

Resolved, That the Council of The Massachusetts Medical Society hereby express its sense of loss in the death of Doctor James Clarke White,—a loss which affects not only the community in which he lived but the whole profession.

Doctor White was graduated from Harvard College in 1853 and from the Medical School three years later. He then spent two years abroad, largely devoted to the study of skin diseases, in Vienna under Professor Hebra, and returned to Boston to take up his life work. During his youth and college days, he had been greatly interested in natural history and scientific study and on his return to Boston he was made Adjunct Professor of Chemistry in the Medical School and a little later Visiting Physician to the Massachusetts General Hospital. These positions he resigned, in 1871, to take charge of a newly-created department of dermatology in the same hospital.

In the same year, he was made Professor of Dermatology in the Harvard Medical School, a chair which he occupied for thirty-one years. It was the first professorship of the kind in Boston and, indeed, the first in any medical school in this country.

He was an active member of the Natural History Society and of the American Academy of Arts and Sciences. He had also an extensive and appreciative knowledge of artistic and literary matters, but his great interest was in his chosen field of dermatology. He was one of the founders of the American Dermatological Association and its first president. He was an attendant at various International Dermatological meetings and held Honorary Membership in many foreign dermatological societies. In 1903, the International Congress of Dermatology was held in New York and Dr. White presided over its deliberations. He was often spoken of as the Father of Dermatology in this country.

In the Massachusetts Medical Society he was long a counselor and librarian. In 1892, he gave the annual oration on "The Relations of the Massachusetts Medical Society to Medical Education." From 1892 to 1894, he was its president.

His erect, well-dressed figure, his careful statements and well-chosen speech were the index of an orderly and logical mind. He was respected and honored by those who knew him and most heartily beloved by those admitted to the circle of his friends.

In speaking of the dead of the year then just past, in his annual oration in 1892, Dr. White said:

"Not a few of us have ceased to labor in the year which closed yesterday,—some when their work had just begun, some in full tide of life, but most in the evening of their days when the last rest had been well earned and could not have been unwelcome."

After an active and fruitful life, Doctor White's rest is well earned, and by these resolutions we express our sincere respect and affection and our deep sense of loss.

ABNER POST,
JOHN T. BOWEN,
WILLIAM L. RICHARDSON.

Dr. G. W. Gay was prevented by illness from preparing resolutions on the death of Dr. David Williams Cheever, and in his absence the president read this tribute:

On December 27, 1915, the Society lost by death, Dr. David Williams Cheever, of Boston, one of its most valued members, its recording secretary in 1866-7, and its president from 1888 to 1890. This noted surgeon and leading member of the medical profession was the son of Charles Augustus Cheever, a prominent surgeon of Portsmouth, and grandson of Abijah Cheever, of Saugus, a naval surgeon of the Revolution. He was born at Portsmouth, November 30, 1831, graduated from Harvard College in the class of 1852 and from the Harvard Medical School in 1858. Appointed demonstrator of anatomy in the School in 1860, he rose to be professor of clinical surgery in 1875, professor of surgery in 1882, and professor emeritus in 1893. From the beginning of the Boston City Hospital in 1864 he served the institution as surgeon for thirty years, becoming surgeon emeritus in 1893. He was known to a long series of medical students and practitioners as a resourceful and bold surgeon; thorough and painstaking in technic and assiduous in after-care. As a lecturer his language was concise, clear and to the point. Dr. Cheever became vice-president of the Boston Medical Library in 1890 and in 1896 he was made its president, holding that office while the funds were raised for the present building and also during the first five years' occupancy of this joint permanent home of the Library and the Massachusetts Medical Society, being always faithful in attendance at the meetings of the managing committee, and fair and impartial in his rulings. He will be much missed.

The president read an obituary of Dr. George Howard Malcolm Rowe, for thirty years superintendent of the Boston City Hospital and a Counselor of the Society from 1895 to 1909. (See BOSTON MEDICAL AND SURGICAL JOURNAL, February 10, 1916.)

Adjourned at 1 p.m.

WALTER L. BURRAGE, *Secretary*.

TREASURER'S REPORT, JANUARY 1, 1916.

Mr. President and Fellows of the Society:

Your treasurer has the honor to report the finances of the year 1915 as follows:

RECEIPTS.

Balance from 1914.....	\$14,906.76
Assessments paid to treasurer.....	1,256.00
Assessments paid to district treasurers:	
Barnstable	\$ 135.00
Berkshire	394.00
Bristol North	269.00
Bristol South	653.00
Essex North	723.00
Essex South	1,018.00
Franklin	184.00
Hampden	941.00
Hampshire	299.00
Middlesex East	335.00
Middlesex North	462.00
Middlesex South	2,068.00
Norfolk	2,124.00
Norfolk South	317.00
Plymouth	454.00
Suffolk	3,178.00
Worcester	1,265.00
Worcester North	418.00
Assessments paid at Annual Meeting.....	\$15,237.00
Sale of Dinner Tickets.....	219.00
Subscriptions for BOSTON MEDICAL AND SURGICAL JOURNAL*	782.00
Interest on Massachusetts Bonds.....	12.00
Interest on deposits, New England Trust Co.	560.00
Interest on deposits, Old Colony Trust Co.	211.32
Interest from Savings Banks for general fund	154.60
Interest from Savings Bank for Cotting fund	43.88
Interest on Annuity Policies of the Mass. Hospital Life Insurance Co.....	121.20
Gift of Dr. M. C. Smith.....	867.86
	51.40
	\$34,422.52

EXPENSES.

President's expense:	
Travelling	\$ 9.82
Postage and printing	7.05
	\$16.87
Secretary's expense:	
Stamped envelopes, and printing	184.30
Addressing circulars	10.00
Engraving diplomas	8.00
Publishing death notices	1.00
Stenographers at annual meeting	51.75
Incidentals	18.72
	\$273.77
Librarian's expense:	
Postage and express	\$ 38.26
Bookbinding	52.80
	\$ 91.06
Treasurer's expense:	
Stamped envelopes, stationery and printing	\$202.70
Clerical work	42.12
Clerk at Annual Meeting	10.00
Premium on bond	37.50
Safety deposit box	10.00
Binding catalogues for Annual Meeting	9.70
Incidentals	2.00
	\$314.02
District treasurers' expense.....	921.20
Bank charges	1.28
Supervisor's expense.....	29.52
Censor's expense	552.00
Guarantee to BOSTON MEDICAL AND SURGICAL JOURNAL	7,303.24
Defense of malpractice suits	569.65

* By far the larger number of these subscriptions were paid direct to the Committee on the JOURNAL, the Treasurer receiving only those that were less than five dollars.

On account of American Medical Association, travelling expenses.....	483.50
Rent	750.00
Salaries of officers of the Society	1,700.00
Salaries of editors of JOURNAL	500.00
Returns of overpaid assessments, less commission	29.70
Annual dividend	4,000.00
Shattuck lecture	200.00
Cotting lunch:	
February	\$ 65.69
June	157.95
October	64.65

\$288.29

Committee of Arrangements:

Cigars	\$119.75
The Copley-Plaza	2,552.90
Police	28.00
Clerks	25.00
Card signs	1.50
Gas and electric appliances	6.00
Printing	14.50
Music	100.00
Incidentals	9.64

\$2,857.29

Committee on State and National Legislation:

Legislative Bulletin	\$10.00
Stenographer, typewriting of envelopes	19.33

\$29.33

Committee on Public Health:

Travelling, postage and stationery	\$39.25
Typewriting	2.50
Incidentals	9.50

\$51.25

Exchange:

Loss on foreign check	.37
Return of wrongly-paid dinner ticket.....	3.00

\$20,965.34

Balance January 1, 1916..... \$13,457.18

This balance is deposited as follows:

Deposit in New England Trust Co.	\$5,605.45
Deposit in Old Colony Trust Co., Bay State Branch	\$7,851.73
	\$13,457.18

It is less than the balance of the same period of the previous year by \$1,449.58.

PERMANENT INVESTMENTS.

The permanent investments of the Society are as follows, there being no change in these investments during the year:

Shattuck Fund:

Annuity policy of Massachusetts Hospital Life Insurance Co.....	\$ 9,166.87
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Phillips Fund:

Massachusetts 3½ per cent. gold bonds..	10,000.00
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Cotting Fund:

Deposit, Roxbury Institution for Savings	1,000.00
Deposit, Provident Institution for Savings	1,000.00
Deposit, Suffolk Savings Bank.....	1,000.00

Permanent Fund:

Annuity policy of Massachusetts Hospital Life Insurance Co.....	11,253.30
Massachusetts 3½ per cent. gold bonds..	6,000.00
Deposit, Franklin Savings Bank.....	1,074.48

EDWARD M. BUCKINGHAM, Treasurer.

Obituary.

THOMAS HUBBARD RUSSELL, M.D.

DR. THOMAS HUBBARD RUSSELL, who died of pneumonia on February 2, at New Haven, Connecticut, was born in that city on December 14, 1851. He received the degree of Ph.B. from Yale in 1872 and that of M.D. in 1875. After serving for a year as resident at the New Haven Hospital, he became physician to the New Haven Dispensary. In 1878 he was appointed surgeon to the New Haven Hospital, and upon his retirement in 1908, he became consulting surgeon. He was successively lecturer on surgery, professor of materia medica and therapeutics, and professor of clinical surgery at the Yale Medical School. He was a member of the American Medical Association, the Connecticut State Medical Society, the New Haven County Medical Society, the New Haven Medical Association and the American Association for the Advancement of Science. He is survived by his widow and five children.

Miscellany.

MEDICO-SOCIAL WORK AT THE BOSTON CITY HOSPITAL.

As director of the medico-social department, established over a year ago at the Boston City Hospital, Miss Gertrude L. Farmer has recently presented a report giving, in part as follows, a more detailed account of its work than appears in its monthly statistical statements:

Our second year in the hospital began on October first, 1915. A year ago our equipment consisted of a desk in one of the corridors of the Surgical Out-patient Buildings. I was the only worker. Now we have a comfortable office in the administration building, a room in the Female Medical Out-patient Department, and a desk with a screen adjoining the Gynecological Department in the Out-patient.

During October, 1914, I dealt with 18 patients and paid 36 visits. In October, 1915, the number of patients referred to us had increased to 127, and we made 152 visits. The number of workers has increased to seven; four of these are on part time.

To anyone familiar with the development of similar work in other hospitals, it is clear that our growth has been as rapid as is consistent with careful organization. Two chief factors have contributed to this progress. First, the cordial, sympathetic reception we have met with from the hospital authorities and employees, and, second, the courage, generosity and fine

judgment shown by our Social Service Committee, in their dealings alike with the hospital authorities and with their workers. During the first months we had to spend a great deal of time in learning the ways of the institution, and adapting ourselves to them. Every hospital is an entity in itself, and familiarity with other similar institutions does not relieve one of this necessity.

We have had 586 patients referred to us during the year. By the executive staff, 117; by the medical staff, 325. The remaining 144 were brought to our notice by one of the nurses or supervisors within the hospital, or by an outside agency. The majority of these patients were sent to us with the request that we should see that they were properly cared for on discharge. In some instances this not only insures a more speedy discharge, but also better care for the patient, because it is one of our chief functions to discover and make use of the numerous charitable and semi-charitable institutions and agencies with which Massachusetts is so richly provided. We have made use of about 150 such organizations this year. The other day a patient was referred to us in order that we might hasten her removal from the ward. She had been three months in the hospital, and no longer needed medical care in the acute hospital. A visit to a relative who lived about ten miles from Boston brought about this patient's discharge in a few days.

We have often been asked to provide follow-up work, whereby patients are induced to return to the Out-patient Department on discharge from the wards, and the out patients are kept coming regularly for treatment until discharged by the physicians. This is a phase of our work which especially appeals to some of the medical staff as it enables them to round up their work. As yet the hospital makes no provision for it. Another frequent request is for oversight and instruction in the home, including nursing care through district nursing and similar associations. Occasionally we are asked to provide some form of material relief. This may include a set of false teeth, a piece of apparatus, or an extra diet in the home. Through a member of our committee we have been given a small emergency fund; before using it we make every effort to obtain what is needed elsewhere.

To provide some form of medico-social work for even 30 per cent. or 40 per cent. of the 60,000 new patients treated annually in this hospital would require a large corps of workers. With our small number of workers, we have had to select certain groups and confine ourselves, more or less carefully, to these. At present we are dealing with the following: A small group of adults from the four medical house services, medical children from the same services, medical children under fourteen in the Out-patient Department, and a group of women from the gynecological service both in House and Out-patient. The fifth worker takes such patients as

may be referred to us outside of the above groups, and helps with the office work.

Since October 1, 1915, we have begun to have the services of a secretary, and have started typewritten records. We hope to develop this secretarial part of the work and make it of real assistance to the case workers in their more arduous duties. Personally, I do not plan to deal directly with patients but to devote myself to oversight and organization.

It is plain that the above plan leaves out of consideration by far the greater part of the hospital, including the aural, ophthalmological, nerve, dermatological, genito-urinary and large surgical services for men, women and children, and the South Department. The latter offers a great field for work in the after care of children. Such cases as we have dealt with from these services have demonstrated as great need of medico-social work as in the groups we have selected, and we are constantly obliged to refuse urgent requests for our services from members of the staff.

In order to make this report brief I have omitted most of the details about our work. Should any member of the Board of Trustees or the Medical Staff be interested to learn more fully what we are doing and how we are doing it, I shall be very glad to give further information. Later in the winter we hope to publish our first annual report. This will include our first sixteen months and make our fiscal year accord with that of the hospital.

Correspondence.

THE DEATH OF SIGNOR DON VINCENT.

BOSTON, Jan. 27, 1916.

Mr. Editor: In view of some recent discussion of the responsibility of the physician for the death of the patient, may I call your attention and that of your readers to the following passage from Le Sage's "*History of Gil Blas*," descriptive of the death of Signor Don Vincent. I quote from the English translation in Everyman's Library.

"It happened soon after this adventure that Signor Don Vincent fell sick. Independent of his very advanced age, the symptoms of his disorder appeared in so formidable a shape that a fatal termination was but too probable. From the beginning of his illness he was attended by two of the most eminent physicians in Madrid. One was Doctor Andros, and the other Doctor Oquetos. They considered the case with due solemnity; and both agreed, after a strict investigation, that the humours were in a state of mutiny, but this was the only thing about which they did agree. The proper practice, said Andros, is to purge the humours, though raw, with all possible expedition, while they are in a violent agitation of flux and reflux, for fear of their fixing upon some noble part. Oquetos maintained, on the contrary, that we must wait till the humors were ripened before it would be safe to go upon purgatives. But your method, replied the first speaker, is directly in the teeth of the rules laid down by the prince of medicine. Hippocrates recommends purging in the most burning fever from the very first attack, and says in plain terms that no time is to be lost in purging when the humours are in ἀγασμός—that is to say, in a state of fermentation. Ay! there

is your mistake, replied Oquetos. Hippocrates by the word *ἀργασμός* does not mean the fermentation, he means rather the concoction of the humours.

Thereupon our doctors got heated. One quotes the Greek text, and cites all the authors who have explained it in his sense; the other, trusting to a Latin translation, takes up the controversy in a still more positive tone. Which of the two to believe? Don Vincent was not the man to decide that question. In the meantime, finding himself obliged to choose, he gave his confidence to the party who had dispatched the greatest number of patients—I mean the elder of the two. Andros, the younger, immediately withdrew, not without flinging out a few satirical taunts at his senior on the *ἀργασμός*. Here then was Oquetos triumphant. As he was a professor of the Sangrado school, he began by bleeding copiously, waiting till the humours were ripened before he went upon purgatives. But death, fearing, no doubt, lest this reserve of purgatives should turn the fortunes of the day, got the start of the concoction, and secured his victory over my master by a *coup-de-main*.

Such was the final close of Signor Don Vincent who had lost his life because his physician did not know Greek."

It would perhaps hardly be fair to cite the above as an argument for the importance of classical studies for physicians, since the worthy Signor died rather from his physician's ignorance of medicine than of Greek. The satire of Le Sage, like that of Molière and other of their contemporaries, is delightful in the quiet irony of its comments upon the medical profession. Surely there is no other department of human learning whose professors and exponents have so risen in popular respect and esteem during the past four centuries.

"T. S."

A QUESTION OF LOGICAL FALLACY.

MILTON, MASS., Feb. 4, 1916.

Mr. Editor: The discussion of the work of Goldthwait and Bryant by Dr. Hooton, which appeared in the JOURNAL of Jan. 27, 1916, lays itself open to a criticism so fundamental that I believe it should not be overlooked. Whether or not the claims of these authors are valid, Dr. Hooton's method of answering them appears to involve a logical fallacy which can be analyzed without expert knowledge of the particular subject.

As I understand it, Goldthwait and Bryant contend that there is a correlation between divergence of human form from the average in the direction of stoutness and certain anatomical features with related physiological and pathological tendencies on the one hand, and a correlation between divergence in the opposite direction and another group of features and tendencies on the other. Dr. Hooton attempts to refute this by citing general averages of entire populations. Thus the average of all measurements made of Norwegians is compared with the average of all measurements of the Swiss, etc., and the comparison fails to substantiate the above correlations. Of course it does, for the *divergences* from the average, which are the especial theme of the studies of Goldthwait and Bryant, have been specifically submerged in the compilation of the general average.

By the same process of reasoning it would be an easy matter to annihilate Mendel's Law of heredity. For example, it is well known that when "blue" Andalusian fowls are bred together the offspring show divergence; in the long run one quarter are black, one quarter "splashed white" and one half "blue," or intermediate between black and white. Now, if we sought the average plumage of all the offspring, the more perfectly Mendel's Law was exemplified, the more nearly midway between black and splashed white would the average fall. If we compared the averages of two separate poultry yards in which the

breed was cultivated, each taken as a whole, we should fail to find in the comparison any correlation in support of Mendel's Law. In short, by misuse of the general average it is possible to obscure Mendel's Law or any other divergences from the mean, which might present significant correlations.

Yours truly,

ALEXANDER FORBES.

A MEMORIAL OF ANGELO CELLI.

THE LEADER OF THE GREAT ITALIAN CAMPAIGN
AGAINST MALARIA.

February 3, 1916.

Mr. Editor: The following notice which has been issued by the Italian Society for the Study of Malaria, has recently been sent to me by Sir William Osler:

"SOCIETY FOR THE STUDY OF MALARIA.

"The Society for the Study of Malaria, of which Professor Angelo Celli was the founder and the animating and guiding spirit, has decided to start a subscription for the purpose of erecting in his memory a monument which will perpetuate the record of his accomplishments for all time.

"It is believed that such a monument should stand on the Roman Campagna, the field of the studies and the object of the most loving care of Angelo Celli; on the spot where he has redeemed man and earth from the scourge of malaria.

"The Society turns not only to its members, but to the scientists, the physicians, the proprietors and improvers of the soil, to the agriculturists, to the teachers; to all who have admired the profound labors and the innumerable beneficent activities of Angelo Celli.

"Gifts may be sent to the Treasurer of the Society, Prof. Alessio Nazari, via Agostino Depretis, 92, Roma.

"President Leone Caetani Principe Di Teano. "Councillors: Prof. Amico Bignami, Prof. Antonio Dionisi, Sen. Giustino Fortunato, Sen. Leopoldo Franchetti, Sen. Prof. Ettore Marchisafa.

"Secretary, Prof. M. Levi Della Vida."

It has seemed to Sir Wm. Osler and to me that we in America, who owe so much to the life-long and persistent studies of the great physician who was the leader of the Italian campaign of prophylaxis against malarial fever, should play our part in contributing to this well-deserved memorial. May we not appeal to the physicians of America to join in honoring this great benefactor of the race.

Any contributions which are sent to the undersigned will be forwarded to the Italian Committee. It is hoped that there may be a generous response and any sum, no matter how small, will be gratefully accepted.

WM. S. THAYER,

406 Cathedral Street,
Baltimore, Md.

THE TOURNIQUET IN TRANSFUSION.

Boston, Feb. 3, 1916.

Mr. Editor: Many men have stated that they have difficulty in the use of rubber tubing as a tourniquet when doing a transfusion, by applying it either too tightly or not tight enough. This can be entirely overcome and the tourniquet question made absolutely accurate by using an ordinary Tyco's apparatus placed high on the arm with the tubing extending over the shoulder. This is kept at the donor's diastolic pressure while filling the tube, which gives the exact amount of venous congestion desired.

Sincerely yours,

A. R. KIMPTON, M.D.

APPOINTMENT.

It is announced that *Dr. Harold G. Giddings* of Boston has been appointed medical examiner for the Massachusetts Accident Company.

NOTICES.

THE NEW YORK HEALTH DEPARTMENT'S SEMI-CENTENNIAL.

To celebrate the semi-centennial of the organization of the New York Department of Health, it is proposed to hold a commemoration dinner on March 8, 1916. The guests will include the Mayor, State Health Commissioner Hermann M. Biggs, Surgeon General William C. Gorgas, General General Rupert Blue, Professor William H. Welch, Doctor Peter Bryce and Doctor Stephen Smith, and Professor Charles F. Chandler.

All engaged directly, or indirectly, in promoting public health, such as physicians, nurses, social service workers, are invited. Subscription six dollars per plate. Those intending to participate are requested promptly to notify *MR. GEORGE ROBERTS*, Secretary, Commemoration Dinner, 139 Centre Street, New York City.

FREE LECTURES ON THE PREVENTION OF DISEASE.

A course of free lectures will be given during February and March by the Public Health Executive Committee of the New York County Medical Society at the Academy of Medicine on alternate Tuesday evenings and Thursday afternoons. The dates of the lectures and the topics to be presented are as follows:

Thursday, Feb. 24th, 3.30 P.M. "Health Measures in the Industries."

Tuesday, Feb. 29th, 8.15 P.M. "The Most Important Inherited and Acquired Evil."

Thursday, Mar. 9th, 3.30 P.M. "What the Medical Laboratory Does For the People."

Tuesday, Mar. 14th, 8.15 P.M. "Better Eyes and the Prevention of Blindness."

Thursday, Mar. 23d, 3.30 P.M. "Woman's Health—Relative to Her Own Field."

The public is cordially invited.

CHILDREN'S HOSPITAL.

The Visiting Staff of the Children's Hospital will hold a clinical meeting in the amphitheatre of the Hospital on Friday, February 18, at 4.30 P.M. Subject: Exhibition of pathological specimens. Discussion of abdominal and retroperitoneal tuberculosis. The profession is cordially invited.

SOCIETY NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting of the Surgical Section will be held on March 8, at 8.15 P.M., in the Boston Medical Library. *Dr. E. Starr Judd* of Rochester, Minn., will present a paper upon "Cholecystitis With and Without Stones."

CHARLES L. SCUDDER, M.D., Pres't.

MASSACHUSETTS GENERAL HOSPITAL CLINICAL SOCIETY.—The Society will hold a meeting Monday, February 21, at 7.15 P.M., in the Out-Patient Building amphitheatre. Program:

1. Demonstration of cases.
2. Differential Diagnosis and Treatment of Traumatic Injuries in the Knee-Joint, *Dr. Abbott.*
3. Torula Disease in Man (with lantern slides), *Dr. Elliott Cutler.*

ELLIOTT C. CUTLER, M.D., Secretary.

RECENT DEATHS.

DR. GEORGE THOMAS JACKSON, who died recently of pneumonia, was born in 1851. He was formerly pro-

fessor of dermatology at the New York College of Physicians and Surgeons.

DR. B. L. MILLIKIN, who died on January 6, was a graduate of the University of Pennsylvania Medical School in 1879. He was formerly dean of the Medical School of Western Reserve University and at the time of his death was senior professor of ophthalmology and senior consulting ophthalmic surgeon at the Lakeside Hospital.

DR. D. HURLBUT ALLIS, who died at Springfield, Mass., on January 31, was born at Hartford, Conn., in 1862. He was a well-known dentist in Springfield.

DR. HUMPHREY F. BRACKETT, who died on January 31 at Brighton, Mass., was born in Maine in 1840. In his early life he was a railroad engineer. In 1880 he began the study of medicine and in 1884 was graduated from the Medical School of Boston University. He was, for many years, examining physician for the Brotherhood of Locomotive Engineers.

DR. ROBERT G. HORNE, who died on February 2 at Watertown, Mass., was born in that city in 1871. After graduating from the Harvard Dental School he had practised his profession in Watertown for twenty years. He is survived by his widow, one daughter and one son.

DR. SIR FRANCIS HENRY LOVELL, who died in London on January 28, had been for many years a distinguished colonial medical officer in the British Empire. He had served as chief medical officer of Mauritius, as surgeon general and as member of the executive and legislative councils of Trinidad and Tobago. He was created a baronet upon his retirement in 1901.

DR. LOIS FITCH MANSFIELD, reputed to have been the oldest woman physician in the United States, died recently at Santa Barbara, Cal. She was born in 1830 at Fayetteville, N. Y., and is said to have been the first to conduct an open-air school in this country.

DR. RUFUS ELMER DARRAH, died at Newport, R. I., Feb. 8, aged 54 years. He was a native of Fall River, Mass., and a graduate of the Harvard Medical School in 1890. He was a house officer at the Children's Hospital and at the Boston City Hospital, and assistant port physician and assistant resident physician at Deer Island in 1891. From 1893 to 1896 he was surgeon to the Boston Dispensary, removing to Newport soon after the latter date. There he practised since, being at one time a member of the Newport Board of Health. He joined The Massachusetts Medical Society in 1890 and retained his membership until his death.

DR. SILAS ARNOLD HOUGHTON died of pneumonia at his home in Brookline, Mass., Feb. 6, aged 51 years. He was born in Keeseville, N. Y., and was educated at the Boston Latin School, at Harvard College, graduating with the class of 1887, and at the Harvard Medical School, taking his M.D. in 1891. He had practised in Brookline since 1892. *Dr. Houghton* was a member of the American Medical Association, Massachusetts Medical Society, Boston Medical Library, Obstetrical Society of Boston. He is survived by a widow and two children.

DR. WILLIAM JOHN TEAHAN died of pneumonia at his home in Brookline, Mass., Feb. 6, aged 51 years. He was a graduate of the College of Physicians and Surgeons, Columbia, in 1901. He joined The Massachusetts Medical Society in 1908 and had practised in Holyoke. He is survived by a widow and two children.

ERRATUM.

In the issue of the JOURNAL for February 3 (p. 172) the name of the lecturer was, by error, omitted from the report of the first lecturer at the Harvard Medical School on "Chronic Ulcer of the Duodenum and Stomach." This address was by *Dr. Charles L. Scudder*, whose name should have been attached to the report of his remarks.

The Boston Medical and Surgical Journal

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Address.

HOW MAY YOU ASSIST THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY?*

By MAJOR WILLIAM O. OWEN, M.C., U.S.A.,
WASHINGTON, D.C.

THE MOST important matter to us, for I still love to think of myself as a member of the Army Medical Corps, is for you gentlemen, our brethren of civil life, specialists in medicine, each and every one of you surgeons, to learn and to know that we too are specialists in medicine. Your special work is surgery; ours, that of giving-sanitary advice and collecting the sick and the wounded of the march and of the battle, to provide food, clothing, medical attention, and transportation for these from the front to the hospital, often miles to the rear. We must train the personnel with which this is to be accomplished. The use that the medical officer has for a knowledge of medicine on the battle-field is to enable him to rapidly and correctly select the salvage which will best enable him to assist the officer in command to win the fight and the campaign. To do this he must save all that is possible for him to save from the wreckage of the battle's destruction. In removing these injured he must so handle the transportation that it will in no way interfere with the steady flow of troops and ammunition to the front. The army medical

officer's training is all to this end. True, he must keep as nearly abreast with the progress of medicine as it is possible for him to do, but his special work is to so advise the commander that the troops will be kept in the best possible physical condition, and to prevent injury to the morale by seeing that the firing line is kept as free as it may be of wounded and helpless men, by removing these wounded men as soon as it can possibly be done to a point where medical and surgical attention can be given properly. That this may be done and well done requires that those who are to do the work must be well trained as medical men and then trained as soldiers in this special function. Imagine yourself called upon to act as the chief surgeon of a division of infantry which had been in action and lost 10% killed and wounded. This would mean for you that you would have to collect and remove from the front within a few hours some 1800 wounded men. In doing this you would have to take command of and control 99 medical officers, 889 enlisted men, using 144 riding horses, 368 draft mules, and 16 pack mules, with 48 ambulances and nearly 50 wagons. This would involve the control and direction of nearly 3000 men, two-thirds of whom were injured and being cared for by the other third. This, as you will readily see, is a soldier's work, and requires a soldier's training. Imagine yourself, fresh from civilian life, suddenly commissioned as the chief surgeon of a division of infantry, a unit of this character committed to your care, and you told to prepare it for battle, the commander in a few brief words telling you of his intention and his desire. Imagine yourself

* Written for presentation to The Society of Clinical Surgery, Nov. 26, 1915.

studying a map trying to visualize an unknown country, undertaking to form a judgment of the most suitable places for your ambulances and hospitals under the instructions you had received. It would be puzzling to get this command of nearly 1000 men out of their camp and on the road, to give each ambulance company its order for the place it was to reach at a definite hour, to each field hospital where it would probably be best protected from the fire of the enemy and the hour you wanted it in position; to give the order in just what direction and to what point you expected to have the wounded evacuated. It is these things, so briefly outlined here, that make the army medical officer a special class of soldier. It was the lack of medico-military preparedness which caused the great scandal in the Crimean War, and the scandal of the war between the states which resulted in the establishment of the United States Sanitary Commission in 1861 to assist the Army Medical Department. It was this lack which caused men to lie wounded on the field of battle for days after the fights of 1861-62, and to die of exposure and lack of food within sixty miles of the City of Washington. It was this same lack of medico-military training which caused the great scandal of 1898, and that of the South African War in 1899. If we can only get the fact that the army medical officer must be a special class of soldier, if he is to render good service, firmly fixed in your minds, you will be in position to be of service, for you will then know that what we need is not a man with a knowledge of medicine, but a medical man who has been trained in the special work of a medical soldier. Any medical man can become a surgeon with proper training. Any medical man can be trained as an army medical officer.

Gentlemen, unless the medical officer who is to see to the collection, transportation, feeding and medical care of the thousands of wounded of a modern war, is trained in the soldier's part of a medical officer's work and well trained, it will spell disaster. No man can handle this work who does not know it, and who has not in the best sense become a specialist in this work. For one of you gentlemen, untrained in this particular specialty of medicine, to undertake this work, is to invite misfortune into your life. Our war history is full of just such disasters. When you shall have learned this and shall have become convinced of its truth, you will then be in a position to know and understand the places where you can be of value to the army of the United States, and there are many places in which you can be of the highest value. You can be of great assistance in caring for the sick in the large hospitals of the rear; this is the accustomed work of your every-day life, in which no outside man can teach you anything. You can help the Army Medical Department to select young men for service in the Army Medical Department; you can push the National Board of

Medical Examiners to the full fruition of its desire, and thus eliminate from the ranks of the profession the incompetent. The young men are the men who would come to assist us in the problems of administration and transportation, for in time of war the army medical man's function changes more than that of any other officer in the service, for he who has trained himself along the lines of giving bedside care to the sick or wounded, now suddenly finds himself confronted with the problems of giving sanitary advice to large bodies of troops, of collecting and transporting the wounded and sick to the hospitals, often miles to the rear. We are expected to prevent the ingress of disease, and to handle the sick and the injured without friction. The younger men should be encouraged in every possible way to go to the camps of instruction now being held in many parts of the United States. Many of you older of the brethren have gone to these camps held for the Medical Reserve Corps officers. Encourage the younger men to go, to study, not military surgery, but the medical service of armies. This is far from being a study of surgery, of medicine, or sanitation, yet involves a knowledge more or less complete of each of them. It consists in applying the knowledge of these matters to the military problem at hand.

You can be of great service to the Army by inviting the attention of the young medical man whom you have trained to the advantages offered to the medical student by a career in the Army Medical Corps. Might not a law be secured which would enable you to recommend to the War Department those medical men of the smaller districts whom you knew to be licentiates of the National Board of Medical Examiners, whom you knew to be competent diagnosticians, men you felt to be well qualified to select recruits for the Army under rules laid down for them by the War Department? Would not such a group of men be of service both in war and peace? In past wars the work of the army medical man has been done under conditions of stress and strain which would not be believed by one who has had no part in it. You have done the work, you have stood the strain, you have suffered the pain. Many of you know the whole story. *Would it not be better to be trained?* Would not this contact between yourself and the Army medical officers be in itself an assistance to them? Would they not feel the encouraging hand of your brotherly interest? Would they not be better for reaching out for your assisting hand? For it is to you, the leaders and teachers of the oncoming generation of medical men, to you, the High Priests at the Altar, in the spotless robes of high purpose and earnest endeavor, to you who keep the fires burning, to whom we must turn for those who are to follow us, to attain to even higher, better things than Lavarán, Ross, and our own Reed and Gorgas.

Original Articles.

CLASSIFICATION OF REFORMATORY PRISONERS.*

BY GUY G. FERNALD, A.M., M.D., CONCORD, MASS.

*Resident Physician, Massachusetts Reformatory,
Concord, Mass.*

WHATEVER a prison physician and laboratory worker may say to an audience of administrative experts on the subject of this session should attempt to contribute to the bases of administrative opinion rather than attempt to suggest administrative methods.

The term "defective delinquent" like the term "insane" has a social significance as well as a psychiatric or laboratory significance. To the layman each is inclusive; but to the psychiatrist each is generic also. Both are good terms when used with discrimination. In the following classification the members of the defective delinquent class are scattered among the various groups of the segregable.

It will be much better both for prisoners and all concerned in their training as well as for the community when they are classified before sentence is passed. In all Chicago criminal courts those accused are examined by competent medical examiners and their assistants and the courts may be furnished with an expert's findings and classification before sentence is imposed. Similarly, in the Boston Municipal Court there is a regularly appointed medical expert who furnishes the courts, probation officers and prison officials with an alienist's classification of prisoners. Other cities are considering the taking of this or some similar step.

It is now an undisputed principle, having been repeatedly enunciated by authoritative writers in the "*Journal of Criminal Law and Criminology*," that when prisoners are dealt with by the courts and prison officials on the basis of their mental condition as determined by competent examiners, rather than in accordance with the kind and degree of their unlawful acts; then a more rapid diminution of criminality may be expected. In other words the administration of remedial measures for offenders should consider the offender rather than the offence. The next question logically is: Why are not prisoners classified earlier? Because the physical equipment for so doing has not been called into existence by public demand.

The immediate advantage of classification to prisoners at the Reformatory consists largely in the broadened basis for judgment afforded the Board of Parole and Pardons and the administration officers, in the increased provision for

the proper training of those of limited responsibility and the adaptation of discipline to defective individuals, some of whom cannot understand the rules they are expected to observe. It should be noted moreover that classification on paper must always precede the practical application of any system of penal administration such as we should seek to realize. Without an architectural plan there is no hope of completeness of structure.

Current classifications of prisoners and of other public institution groups take cognizance very properly of such gross and obviously differentiating characters as sex, age, length of sentence and kind of offence, factors the recognition of which is essential to a working organization within the institution to satisfy the immediate demands of industrial, social and educational adjustment. But what is sought by sociological students, institution officials, philanthropic agencies and legislators, is a classification into essential groups such that the individual prisoner's needs may be effectively and economically met. Classifications then should be such as will distinguish clearly the kind of individual, his degree and kind of mental aberration or peculiarity, if any there be and enable the adaptation of teaching methods, of custodial care and of educational uplift to the individual and to the definite group which he represents.

A classification should be: (1) easily understood, i.e. workable, (2) informing, and (3) definitive.

CROSS-REFERENCE TABULATION OF PSYCHOPATHIC DIAGNOSES.

MASSACHUSETTS REFORMATORY, 1914-15.

		GRADES OF MENTAL EFFICIENCY.		
		Normal	Subnormal	Segregable
Intracranial Descriptive Designations.				
Competent	Accidental offender.....	33	1	
	Responsible offender.....	168		
	Alcoholic	14		216
Deviate	Recidivist	48	20	68
	Alcoholic degenerate	55	6	61
	Congenital syphilitic	10	6	16
	Epileptic	3	2	5
	Insane		4	4
Deficient	Moron	93		93
	Feeble-minded	42		42
	Imbecile	1	1	136
	Psychopath	19	56	13
	Drug habitué	5	2	1
	Unclassified	34	8	
	Total	273	285	99
		42%	43%	15%
				657

* Read before the annual meeting of the Massachusetts Conference of Charities at Pittsfield, Oct. 21, 1915, and as deleted before the semi-annual conference of the Massachusetts State Board of Insanity at the State House, Nov. 16, 1915.

To be sufficiently informing and yet workable there should be revealed at least the kind of

mentality and the degree of efficiency. In a simple classification the degree of efficiency may be uniformly expressed for each prisoner by classifying him in any one of two, three, four or more categories, *e.g.* as normal and subnormal or normal, subnormal and segregable, terms which represent definite degrees of mental efficiency separated by definite lines of demarcation. Besides this quantitative classification there should be a qualitative designation for each case as a cross-reference. The numbers of these descriptive designations must be much larger, depending on the number of recognizable varieties of mentality encountered. And there is also danger of so multiplying the designations of "kind" or variety of mental departure as to render the classification cumbersome. Some essential classes are: epileptic, insane, congenital syphilitic, recidivist, alcoholic, constitutional psychopath, moron, drug habitué, etc.

By whatever titles these entities be designated the province of each is distinct and definite, *e.g.* to the medical examiner the limit of the group "epileptic" is nowhere coextensive with that called "insane," and the term "moron" is applied only to the purely intellectual defective. The recidivist is the habitual offender, often with antisocial tendencies and character defects, who repeats his errors of conduct, possibly because of an inherited tendency or an acquired twist of purview, or some mental conflict which may defeat his ability to profit by experience. He may talk glibly in street-corner slang and sophistries and show good ability in some lines but his moral obliquity seems to be beyond his control. Many of these are incorrigible and prompt and persistent liars. The moron is the high-grade feeble-minded individual with or without antisocial tendencies. The accidental offender has no intelligence defect. He may lack stability of character, is often indolent and disregardful of the consequences of his acts and of the rights of others. His reason or ambition or pride may be appealed to, however, and his self-control regained. The constitutional psychopath may show good ability along some lines but he is unstable, unreliable, erratic, emotionally labile and in crises uncontrolled. A man's mental faculties taken singly may not be subnormal; but his life history may be one of failure nevertheless because of his inability to coordinate those faculties. Such a man is a failure as a social unit and it is seldom indeed that one can be credited with a normal degree of efficiency.

Surveys of simple classifications with cross-references like those cited, show, *e.g.* the number of alcoholics whose mental efficiency may be graded as normal and the number of alcoholics whose mentality has retrograded to the extent of their becoming subnormal or the number of feeble-minded of so low a grade of mentality that they require special training. Such classifications based on recognized mental conditions and revealing actual individual needs constitute the

best available criteria for legislators and institution builders and administrators. Knowing the content of groups of prisoners in size, degree of mental efficiency and kind of mental departure, one may plan the size and kind of school rooms, the kind of school teachers, the height of brick walls and may intelligently adjust the social, disciplinary and educational requirements of each group.

No one examination will give an adequate basis for a judgment on the kind and degree of a prisoner's mental efficiency. Something more than a cross-section view is needed, even though that cross-section view include a glance at all of the very many mental factors essential to be studied. It would not be enough to see the complicated mental mechanism at work for an hour, even if that were possible. A knowledge of the patient's anamnesis is essential and this may be obtained by well-trained conscientious field workers. Without a full knowledge of the life history, however, no true or adequate conception worthy of serving as a guide to the alienist's judgment is possible. The basis of the medical psychologist's findings must be his full clear clinical case records.

Tests of intelligence are essential but their value has probably been over emphasized by students, perhaps because they are so obvious and easily available. They have their place in the examiner's armamentarium but can never give essential information outside their province, which is very definite and by no means inclusive. Tests adapted to the intelligence of school children are not adapted to differentiate reformatory inmates in kind or degree of intelligence. The advance in intellectual development from one year to the next in mental age diminishes as the age increases and 15 years is regarded as that of the normal adult mental level. The intelligence of most prisoners is above that of the intellectual level of nine and the difference between the intellectual level of 13 and 14 or 14 and 15 is very small. Tests used to differentiate children of different degrees of intelligence are not adapted to reveal these small differences and furthermore, tests chosen for school children are not well adapted to apply to adults in years, even though they be of a low order of intelligence.

In spite of every effort to be exact and definite in forming concepts of mental groups, the fact will constantly force itself on the examiner's attention that there are borderline cases which present characteristics of more than one group. These require intensive study and repeated observations. For instance, a recidivist may have a grave judgment defect and in crises act foolishly or not at all, or an alcoholic degenerate may be a repeated offender with the character defects of the recidivist, and he may be, moreover, an epileptic; but the fact that certain observed cases are confusing is no reason why mental group entities should not be clear and distinct.

A brief outline of the machinery of a system of inmate classification may be of interest. This might consist of the laboratory case records, the essential features of which are for each case: (1) the anamnesis, (2) the clinical notes and (3) the diagnosis sheets or cards to which are added surveys, card indices and other laboratory accessories. The anamnesis may be a large sheet or calendar on which are systematically assembled the vital statistics of the case and of his ascendants and siblings, the childhood history, family life and training, school history, religious training, manner of leaving school, attitude toward family, friends, employers, teachers, special tendencies early and late, habits of diligence or shiftlessness, recreations, escapades, excesses, offences, later failures, successes, arrests, incarcerations and his reactions thereto. To these are added the institution records of industrial training, school progress and conduct marks. The clinical notes bear the record of the laboratory test scores and the content of the examiner's interviews. All opinions and findings are reserved, however, for the diagnosis sheets which may be filed on cards of various significant colors and employing for identification a code intelligible only to the elect.

The collection of the above-indicated material from the prisoner, from his home, employer and friends and from the court and police and institution records must be entrusted to skilled officers and field investigators. There is a real advantage in enlisting the service of those specially skilled in this kind of interviewing. The interpretation of the assembled material can hardly be delegated, however. The examiner should be specially fitted by training, experience and temperament for the delicate task of interpreting the assembled results from all the available sources of information.

The progress and future development of penology is directly dependent upon the evolution of classification of offenders. With only the definite knowledge of the needs of certain mental groups now available, it is clear that the penal institutions of the future will show radical departures in arrangement and adaptation from those we now have. Now that classification on the basis of mentality opens another avenue of advancement, certain features of our present procedure seem very crude and very illogical, e.g. it is very illogical to impose a definite sentence upon anyone incompetent mentally to support himself honestly. What such a one needs is treatment, not punishment. And it is illogical to limit his incarceration when he needs a long course of specially adapted training similar to that of the feeble-minded, the limit of which can be determined only by the slow progress he makes. He should be committed, not sentenced. To quote from our pamphlet published in 1912:* "The responsibility of defective delinquents is limited. Therefore they should

be committed to a suitable institution instead of being sentenced for punishment with fully equipped misdemeanants." The Justices of our courts deplore the necessity of sending these defectives to a penal institution; but since there is no other place, inadequately equipped offenders must be sent there or soon be turned loose again on the community. It is not that the producers of the community have not been willing to care for the parasites in a better way, but rather that no better way was available. But now, as the members of the mental groups are pointed out, and the essential groups themselves become definitely limited, the means of supplying the needs of those groups may be safely left to those handling administrative problems.

CONCLUSIONS.

1. The classifications of public institution inmates should be extended beyond the obvious divisions according to age, sex, reason of incarceration, etc., to include designations of variety and degree of mental departure since the individual, not his offence is to be treated.

2. The advantages of such a classification are: (1) better intramural adjustment and teaching, and (2) a broader basis of judgment in the study of imminent administrative problems by boards of control, by legislators and institution builders.

3. There are certain classes of mental deviates and deficients of limited responsibility who should not be sentenced with fully responsible offenders; but who should be committed to a specially adapted institution as are the insane and feeble-minded.

4. A medical examiner's survey of the full clinical case records containing the assembled significant factors of the life history, supplemented by repeated examinations of the mentality covering the whole field of mental activity is essential to a fair classification.

VENESECTION AS A THERAPEUTIC MEASURE.

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ALTHOUGH venesection is one of the oldest therapeutic measures known, medical literature contains little accurate information concerning its effect on the human circulation. Since the development of precise methods of measurement in medicine it has been but rarely employed, and though it is mentioned in many systems of medicine as a manoeuvre to be considered under desperate circumstances, the impression is conveyed that the circumstances

* The Defective Delinquent Class: Differentiating Tests. Amer. Jour. of Insanity, Vol. lxviii, No. 4, April, 1912.

must be desperate indeed, that the danger to the patient is great and the hope of benefit small. Precise indications for its use, and accurate data as to results, are conspicuous by their absence.

This paper is an attempt to contribute to the knowledge concerning venesection. Deductions are drawn from a series of fifteen cases, observed in private practice and in the wards of the Robert Brigham Hospital. In the series venesection was performed on twenty-two occasions: once on each of eleven patients, four times on one patient, three times on one patient, and twice on each of two patients. On each occasion a careful record was kept of the patient's subjective and objective symptoms before and after the manoeuvre, and whenever possible of the physical findings, pulse rate, blood pressure, and urinary output under the same conditions.

The cases in which venesection was performed may be divided into three groups, according to the pathological condition represented. Group one comprises those cases in which there was valvular disease of the heart, with decompensation. Group two is composed of cases of chronic nephritis with hypertension and cardiac hypertrophy, in which, at the time of bleeding, there were evidences of circulatory failure and impending uremia in varying degrees. Group three represents cases of hyperpiesis, or "essential hypertension." These cases very probably are nephritic in origin, but as their symptoms are quite unlike those of group two, they will be considered separately. There is also in the series one case of acute nephritis with uremic convulsions.

Group one contains four cases, of which two will be reported in some detail. All the cases in this group were of mitral disease, with stenosis and regurgitation.

CASE 1. Woman of 49. Hospital No. 73. Diagnosis: Mitral stenosis and regurgitation, relative aortic insufficiency, hypertrophy and dilatation of the heart.

Examination at the time of admission showed an anxious looking markedly dyspnoeic woman, with moderate cyanosis of the lips and ears, and marked edema of the legs and feet. Pulse rapid and irregular,—130 at the apex, 100 to 110 at the wrist. Both lungs were full of moist râles, there was slight right hydrothorax, and a tender liver could be felt 8.5 cm. below the costal margin.

Patient given morphia and digipuratum subcutaneously. She slept but little that night, coughing a great deal. At five in the morning complained of sudden increase in dyspnea. Cyanosis became very marked, pulse irregular and poor quality. given strychnia and digipuratum subcutaneously.

Two hours later she was much worse. Extremities were cold, pulse barely palpable at the wrist. The right cardiac border was 4 cm. from the mid-sternal line. Respirations, 35. Venesection was performed and ten ounces of blood were removed from the arm vein. After the removal of five ounces respiration became less labored, and at the end of the operation had dropped to twenty, the right border of the heart was no longer demonstrable beyond the sternal border, the apex rate had

fallen from 130 to 100, while the radial pulse had become fair in quality, rate 90 to 96. The cyanosis was much less, and there was marked diminution in the râles heard in the lungs. Half an hour after the operation was over the patient fell asleep, and slept sixteen hours without drugs.

Four months later the patient was again bled. She had been taking digitalis almost constantly, in spite of which decompensation had again occurred. Examination before venesection showed: marked cyanosis, respirations 36, apical pulse 130, irregular, radial pulse 80, blood pressure, 125 systolic, 70 diastolic. Right border of cardiac dullness 5 cm. from midsternum, moist râles at the bases of both lungs. Urinary output for preceding twenty-four hours, 12 ounces less than fluid intake.

One hour after the withdrawal of ten ounces of blood, the patient was again examined. The cyanosis was much less, respirations 18, apical pulse 100, radial pulse 90, blood pressure unchanged. Right border of cardiac dullness 2 cm. from midsternum, only a few râles heard in the lungs. Urinary output during the following twenty-four hours equaled fluid intake, and twenty-four hours later had exceeded the intake by thirteen ounces. No other change in treatment had been made.

Venesection has been performed on this patient on two other occasions separated by intervals of about four months, with results very similar to those described.

CASE 2. A girl of 16 had been in the hospital over a year, with rheumatic endocarditis, subacute in character, causing mitral stenosis and regurgitation. During her stay in the hospital, the patient had periods of fever, rapid pulse and discomfort, but never any signs of marked decompensation. The right side of the heart had never been demonstrably enlarged. Pulse rate varied between 80 and 120, blood pressure between 108 and 130, systolic; 60 and 85, diastolic.

August 15, the patient was seized with sudden very urgent dyspnea and cough, raising sputum which was at first white and frothy, later pink. Right border of cardiac dullness 4.5 cm. from midsternum. Lungs filled with moist râles. Pulse 140, irregular, respirations 30, temperature 100. Blood pressure 220 systolic, 130 diastolic.

Given morphia, nitroglycerin and digipuratum subcutaneously. Remained restless and dyspnoic during the night, sleeping poorly on account of cough. Dyspnea persisted. The next evening there was a similar attack, similarly treated. There was some relief, but the dyspnea, cough and pulmonary edema persisted, and the blood pressure remained high (190 systolic, 120 diastolic).

Forty-eight hours later the patient had a third attack, and venesection was performed, eight ounces of blood being removed. Examination before bleeding showed: Right border of cardiac dullness 4.5 cm. to right of midsternum, lungs filled with moist râles. Patient coughing, raising pink frothy sputum. Pulse 160, blood pressure 200 systolic, 120 diastolic. Respirations 50.

By the end of the operation the patient had stopped coughing. The pulse rate was 120, respirations, 24. Two hours later pulse rate 110, blood pressure 160 systolic, 95 diastolic. Patient slept comfortably during the night without opiates. The next morning the pressure was 140 systolic; 80 diastolic. Pulse rate 96. Respirations 14, lungs clear, right border of cardiac dullness not demon-

strable. There was no recurrence for five weeks. Since that time the patient has had two severe attacks, becoming pulseless in one, and obtaining marked relief in each instance from venesection.

These two cases illustrate the effect of withdrawing venous blood upon a heart which is laboring against right-sided dilatation. In that condition it is unable to empty itself effectually, with the result that the dilatation is still further aggravated by the increase in residual blood. There follow pulmonary stasis and edema, asphyxiation as evidenced by the marked dyspnea, and because of the asphyxiation, the blood pressure, both arterial and venous, rises, still further increasing the load on the heart.

Under such conditions, venesection probably acts in several ways to produce relief. To some extent it diminishes the amount of blood flowing into the right auricle from the venous system. This gives the stretched muscle a chance to contract more efficiently. As Burton-Opitz¹ has shown, the viscosity of the blood is markedly diminished in half an hour by venesection, which, if the heart force remains constant, greatly increases the rate of blood flow throughout the body. It usually causes a marked fall in arterial pressure, which as the writer has shown in a previous paper,² persists longer than a fall due to drugs. The first case cited is an exception to this rule. The blood pressure was normal before and after venesection. The writer has no explanation of this fact to offer, but it is interesting to note that a normal pressure may be unaffected by the withdrawal of an amount of blood which in the presence of hypertension causes a marked drop. In none of the cases in this series was a drop in pressure followed by symptoms of shock, in fact there was always strikingly increased efficiency of the circulation.

Owing to the ease with which arterial pressure is measured, there exists a tendency to regard it as a reliable measure of the efficiency of the circulation, and to feel that a high pressure is proof of an efficient circulation, and a falling pressure means decreased circulatory efficiency. The important factors of rate of flow and venous pressure are disregarded by the clinician because he has no method of measuring them. They are, however, more important in determining the efficiency of the circulation than is the arterial pressure, so long as it remains in rather wide limits. Lewis³ has shown conclusively that increased velocity of the blood stream occurs simultaneously with a fall in arterial pressure (in one experiment from 250 to 180 m.m.), due to venesection. Albutt⁴ states, "thus we see that the amount of blood carried to the periphery may be largely independent of the blood pressure." So long as the velocity of the circulation does not fall below the margin of safety, no shock will result from a fall in blood pressure. It is reasonable to suppose, there-

fore, that venesection operates beneficially on the circulation when stasis is present, in three ways: 1, It diminishes to some degree the amount of residual blood in the right side of the heart, allowing the dilatation to subside. 2, It reduces arterial blood pressure, thus lessening the work of the heart in systole. 3, and this is probably the most important factor, it increases the velocity of the circulation, supplying the organs with an increased volume of blood in a unit of time. And, as the cases already reported and the others in the series show, its results appear more quickly, and are of longer duration, than those obtained by drugs.

The cases in group two further illustrate the effect of venesection on the circulation, and suggest an added result due to the removal of toxic products from the circulation. The cases in this group are of the well-known cardio-renal type, in which symptoms are due to two factors: the failure of the heart to respond to the extra demand made upon it by the altered circulatory conditions, and the accumulation in the body of toxic products which are not removed by the damaged kidney. The effect of venesection upon the heart in these cases is probably identical to that seen in cases of valvular disease in furnishing a respite to the tired organ, but there is evidence to show that it also performs another function in removing toxins from the circulation. This effect is illustrated by the following case.

A boy of fourteen was seen four hours after the onset of convulsions. The history was as follows: Four years previously patient had had scarlet fever, followed by swelling of the face and albumin in the urine. Under treatment the trouble had subsided and the patient had been in good health until a week before the onset of convulsions, when he had begun to complain of headache and nausea. These symptoms had been ascribed to indigestion. Four hours before he was seen by the writer the boy had been found in a convulsion by his mother.

Examination showed an unconscious patient. There was some muscular twitching. The blood pressure was 160 systolic. The cardiac apex was in the fifth space, one finger's breadth outside the nipple line. A catheter specimen of urine was bloody, and showed a very large trace of albumin on boiling. Subsequent examination of the sediment showed casts, blood, and round cells.

During the examination the patient had a typical convulsive attack, the sixth since onset. Venesection was performed and twelve ounces of blood withdrawn. There were no convulsions after the venesection. Six hours later the boy was conscious and rational, and under treatment regained his usual strength, though the evidence of nephritis persists.

It would be unsafe to ascribe the cessation of the convulsions to the venesection on the strength of one case, but the same thing is reported by obstetricians as occurring in eclampsia. It is generally believed that uremic and eclamptic convulsions are due to cortical irritation by a toxic substance circulat-

ing in the blood, and it therefore seems logical to suppose that the abrupt cessation of convulsions following venesection in those conditions is due to the removal of such substances in the blood withdrawn. Another point in support of this argument is the fall in arterial pressure, since the high pressure encountered in nephritis and eclampsia is in part due to vascular spasm.

Even before the uremic stage of chronic nephritis venesection may afford marked relief, and in the majority of cases (seven out of eight in the writer's series) gives rise to diuresis. This is well illustrated by the following case.

A colored man, 52 years old (Hospital No. 93) entered the hospital with the diagnosis of chronic glomerular nephritis, cardiac hypertrophy, and dilatation. Following venesection at entrance he was given digitalis, fluids were restricted to a liter daily, and a protein poor diet was ordered. The patient was kept in bed. In spite of this treatment he gradually lost ground, until three months after entrance venesection was performed.

Examination at that time showed marked dyspnea, the cardiac apex in the sixth intercostal space 13 cm., from the midsternum, the right border of dullness 6 cm. from the midsternum, and a tender liver edge 3 cm. below the costal margin. There were a few moist râles in the lungs, and the thighs, legs and ankles showed moderate edema. Respirations 40, pulse rate 120, irregular. Blood pressure 220 systolic, 130 diastolic. The urinary output had fallen to eight ounces in twenty-four hours, though the fluid intake remained constant at thirty ounces. Digitalis and diuretics had failed to control the situation. Therefore, venesection was performed and ten ounces of blood removed from the arm.

Before the operation was finished the dyspnea had disappeared, and the respirations had fallen to 28. The pulse had decreased from 120 to 100 and had become regular. Blood pressure 180, systolic, 100 diastolic. One hour later the patient was asleep. The following morning he reported that he had had a comfortable night. The pulse rate was 80 and the respirations 18. With the fluid intake limited as before, the urinary output rose to 81 ounces, and remained above the amount of liquid ingested until the edema had entirely disappeared. The right border of cardiac dullness was four cm. from the midsternum twelve hours after venesection.

It is possible that the diuresis was maintained somewhat by the digitalis the patient was getting. If so, the case illustrates the point made by Mendel¹ that venesection may so improve the circulation of the heart itself that drugs previously inert may become effective. This result was noted in two of the writer's cases. Inasmuch, however, as all the cases in this group showed a definite diuresis following venesection, whether accompanied by the administration of drugs or not, it seems fair to conclude that the maneuver has a diuretic effect in cases of cardio-renal disease. The relief of the dyspnea, insomnia and headache may be ascribed in part to the improved circulation, in part to the removal of toxic material. The slowing of the pulse, which occurred in all the cases in this series, is due in all probability to the more efficient work of the heart against lessened arterial pressure. From a clinical standpoint, however, it is the facts themselves that

are important, and the lack of a convincing explanation for them does not lessen their value.

The third group of cases includes those described by the English writers as hyperpiesia, or as they are called in this country, hypertension. The underlying cause is not demonstrable, clinically, though at autopsy arteriosclerosis, nephritis, or both are found to be present as a rule. The symptoms are generally cerebral, consisting of irritability, forgetfulness, transitory attacks of aphasia; but vertigo, headache and attacks of weakness are not uncommon. Cardiac decompensation is not a marked symptom in these cases, and the urine often shows nothing more than a low specific gravity. In all probability they represent the beginning of arteriosclerosis, and the high tension is due to the presence in the body of the toxic substance or substances which finally produce arterial degeneration.

The following case is illustrative:

A minister, 49 years old, was seen by the writer in March, 1912. His family and past history were negative. For three years he had been suffering from severe headache, mental confusion, and transitory attacks of aphasia. Under his physician's care had had periods of relative comfort, but these had been growing less frequent and shorter.

Examination showed a well nourished man in apparently good health. The cardiac apex impulse was palpable in the sixth intercostal space, 14 cm. from the mid-sternal line. Left border of dullness corresponds. No enlargement to the right was made out. Heart sounds regular, no murmurs. The aortic second sound was sharp and ringing. Pulse not remarkable save for its high tension. The artery walls were just palpable, but not tortuous. The urine showed a specific gravity of 1010, no albumin or sugar, the sediment contained no pathological elements. The Wassermann reaction was negative. There were no signs of cardiac decompensation.

At the time of examination the patient complained of headache and a feeling of constriction over the temples. He was very depressed because his mental condition interfered seriously with his vocation. Venesection was advised and accepted, and twelve ounces of blood were withdrawn. The headache was relieved half an hour after venesection was begun. In an hour, the arterial pressure had fallen from 225 systolic and 140 diastolic to 160 systolic and 100 diastolic. In spite of this marked and rapid drop, there were no ill effects.

Six weeks later the patient reported that he had been free from all unpleasant symptoms since the venesection, and three months later consulted the writer to learn how often it would be safe for him to be bled. His symptoms were beginning to return, and he was anxious to obtain relief. A subsequent phlebotomy, four weeks later, was followed by relief again.

In this class of cases the symptoms may be due to the high pressure, to toxemia, or to cerebral anemia due to vascular spasm. In any event, venesection meets all the indications. The pressure is lowered, some toxic material is

removed, and vascular spasm is diminished. Albutt⁴ says, "In hyperpiesia, venesection is not only well borne, but its effects seem far reaching. It compasses some profounder alteration, lying beyond our direct appreciation."

How often it is safe to bleed a patient with hypertension has not been definitely established. It has been determined by Lyon⁵ that, after small losses of blood, the number of corpuscles reaches the normal again in from two to five days. In hemorrhages which amount to from three to five per cent. of the body weight, he found the period of regeneration to lie between five and fourteen days. The amount of blood withdrawn in chronic cases does not approach this limit, and it is seldom that venesection is indicated within a month after its last performance. There is, therefore, probably no reason why phlebotomy should not be repeated as often as the indication arises, within reason. The danger of permanently altering the blood by repeated blood letting does not seem, from the evidence at hand, to exist as a practical objection. Fox⁶ and Albutt⁴ both report cases in which venesection was practised repeatedly through a number of years without any ill effects. The results in the writer's cases agree with those of the authors cited. Fox⁶ has noticed, moreover, that such repeated venesections have permanently reduced excessive blood pressures, although the amounts of blood withdrawn were far too small to produce such effects in a direct manner. Mendel⁷ agrees with these conclusions, and believes that better results are obtained from blood-letting than from less vigorous measures. It seems fair to conclude that the measure is without danger in these cases of hypertension, and that the results, so far as they go, are favorable.

In conclusion, the following statements seem justified by the cases reported by the writer and others:

1. Venesection, performed under proper indications, is not a dangerous measure, especially since the "dose" can be accurately controlled.

2. In the presence of dilatation of the heart, renal toxemia, hypertension or a combination of these conditions, it may be expected to act more promptly and more surely than drugs.

3. It lowers blood pressure and at the same time produces a more efficient circulation when performed in cases of hypertension, but does not, in therapeutic "doses," lower normal arterial tension.

4. It should never be performed in the absence of definite indications, but should not be withheld until the hope of success for any measure is gone.

5. The amount of blood to be withdrawn is to be decided by the point at which relief is obtained. The error is generally on the side of too small an amount.

6. Repeated blood-letting, when indicated, does not seem to have any ill effects upon the composition of the blood.

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A BRIEF HISTORY OF GASTRIC INTUBATION.

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It has been stated, on good authority,¹ that Baron Larrey, Sr., preceded Kussmaul in the use of the stomach tube, having employed it with success in the nourishment of tetanus patients, and in the case of Marshal Murat, who had been badly wounded in the neck (1799). In these cases,² it appears that Larrey employed an œsophageal tube of gum elastic, which was introduced into the pharynx and passed a short distance down the œsophagus. It does not appear that the tube penetrated the stomach, for Larrey says that, at first, "we could not determine whether the tube was in the larynx or the pharynx, until a few drops of fluid had been introduced. If in the former, a suffocating cough was the result." To avoid this attack, Larrey himself directed the tube with his finger into the aperture of the œsophagus, but it does not seem that he ever went further than simple œsophageal intubation. In regard to Kussmaul's priority, it is well to note that the title of his monograph of 1869 is "Ueber die Behandlung der Magenerweiterung durch eine neue Methode mittelst der Magenpumpe." In other words, Kussmaul was the first to employ gastric lavage in dilatation of the stomach from pyloric obstruction. The fact that his memoir is printed as an academic festal "Programm" of the University of Freiburg, in celebration of the birthday of Grand Duke Friedrich, indicates the importance he attached to this therapeutic innovation. Glancing at the first pages of the Programm, we find that on September 19, 1867,³ he had already made a communication on the subject to the Deutsche Naturforscher und Aerzte at their Frankfurt meeting, and that on the authority of Bowditch, he attributes the invention of the stomach-pump to Dr. Wyman of America. But the stomach-pump has a much more ancient history, and the real point about Kussmaul's priority is that he was indubitably the first to wash out the stomach for a pathological condition other than poisoning.

In the Galenic treatise on "The Physician," we find the brief sentence that "to empty a full

bladder, an instrument shaped like a Roman S is employed, which Erasistratus calls a catheter.⁷⁴ But even before the time of Erasistratus (300 B.C.), it seems likely that the simple idea of introducing a hollow tube into the rectum or urethra, if not into the œsophagus or larynx, must have occurred to more than one ingenious person. In the well-known section on "Medicinal Remedies which have been borrowed from Animals" in Pliny's Natural History,⁵ occurs the familiar instance of the ibis which "by means of its hooked beak, laves the body through that part by which it is especially necessary for health that the residuous food should be discharged." Any hollow tube in nature, such as bamboo or the flexible stalks of water-lilies or other aquatic or semi-aquatic plants, perhaps tipped with bamboo, might well have been adapted for this purpose, in the first instance. The Thakore Saheb of Gondal, in his "History of Aryan Medical Science" (1896), mentions twenty varieties of Nadis or "tubular instruments like catheters" used by the ancient Hindus (p. 182), and states that, in their surgical teaching, dummy catheterization was practised on "an unbaked earthen vessel filled with water" (p. 185). The large number of cases in which elongated objects have been found in the male or female bladder will suggest that the idea of catheterizing the bladder per urethram did not require any great stress of mind, and that the notion of the simple siphonage of the stomach's contents may have occurred to primitive man, even if he found it difficult or impossible of accomplishment. Indeed, it will be found that the crude idea of nearly every therapeutic procedure of permanent value came from primitive or semi-cultured people, and the history of each has "a long foreground." In the textual history of medicine, however, the "law of priority" is that credit, in each case, shall be given preferably to the author of the first published record of the discovery or invention.

In the case of intubation of the stomach, we find such a record in the graduating dissertation of Alexander Monro III (1773-1859) of Edinburgh (the "evergreen *tertius*"), which deals with the subject of difficult deglutition (*De Dysphagia*). In contesting John Hunter's priority in the matter of passing food into the stomach by means of a tube (1790), Monro *tertius* states that thirty years before the publication of his own graduating thesis of 1797, his father, Monro *secundus*, had employed a flexible tube with bellows and speculum oris, for removing dangerously fermenting fluids and gases from the stomachs of cattle. The son gives a full description of this apparatus, which is figured on plate xiv of his dissertation, and which, if we may credit his statement, dates back to 1767. From a newspaper of the period, he gives the following description of the instrument by Monro *secundus*:

"This tube is to be composed of an iron wire, much larger than a common stocking wire, or about 1/10th part of an inch in diameter. In order to give it the cylindrical form, it is to be twisted around a thick rod of iron; and, after taking it off the rod around which it was turned, it is to be covered with smooth leather.

"To the end of the tube, which is intended to be passed into the stomach, a brazen pipe, two inches long, of the same size as the tube, and pierced with a number of holes, is to be firmly connected.

"To prevent the tube from bending too much within the mouth or gullet, in time of passing it down into the stomach, an iron wire, 1/8th of an inch in diameter, and of the same length as the tube, is put within it, which is to be withdrawn when the tube has entered the stomach.

"The space from the foreteeth to the bottom of the first stomach of the largest ox, measures about six feet; the tube, therefore, ought to be six feet long, that we may be sure of its answering the largest oxen.

"And, to prevent the tube from being injured while it is introducing, a speculum oris, of a large size, the under plate of which is one foot long, and three inches broad, and the screw which separates the two plates about six inches in length, should be previously put into the ox's mouth, that his tongue may not come in the way, and that he may not crush or break the tube with his teeth.

"After the tube is passed into the stomach, it may be allowed to remain within it for any given length of time, as, when it is pressed to one side of the throat, it does not interrupt the breathing of the animal.

"The greater part of the elastic and compressed fixed air will pass through the tube, and, if it be thought necessary, the remainder of it, or the superfluous drink, may be sucked out by bellows fixed at the upper end of the tube, with a couple of valves, one at its muzzle, and the other in the side of it, so disposed as to allow the air to pass in the direction outwards."⁷⁶

On September 21, 1790, John Hunter read to the Society for the Improvement of Medical and Chirurgical Knowledge a "case of paralysis of the muscles of deglutition, cured by an artificial mode of conveying food and medicines into the stomach." He describes his apparatus as follows:

"The instrument made use of was a fresh eel-skin, of rather a small size, drawn over a probang, and tied up at the end, where it covered the sponge, and tied again close to the sponge, where it is fastened to the whalebone, and a small longitudinal slit was made into it just above this upper ligature. To the other end of the eel-skin was fixed a bladder and wooden pipe, similar to what is used in giving a clyster, only the pipe was large enough to let the end of the probang pass into the bladder without filling up the passage. The probang, thus covered, was

introduced into the stomach, and the food and medicines were put into the bladder, and squeezed down through the eel-skin.

"The instrument did not produce irritation in the fauces or œsophagus; in such cases, the parts losing their natural sensibility, allow greater liberties to be taken with them. An eel-skin seems very well adapted for this purpose, being smooth, pliable, and readily passed into the stomach; but as cases of this kind may occur where eels cannot be procured, a portion of the gut of any small animal, as a cat or lamb, will make a very good substitute."

Thus it appears that, in the eighteenth century, *Monro secundus* (1763), *John Hunter* (1790), *Monro tertius* (1797) and *Larrey senior* (1799) employed or recommended each a flexible tube for artificial feeding or for withdrawal of the contents of the stomach.

The next record in point of time is that of the Philadelphia surgeon, *Philip Syng Physick* who, in the *Eclectic Repertory and Analytical Review* of October, 1812, gives an "Account of a New Mode of Extracting Poisonous Substances from the Stomach" (pp. 111-113). The case was one of laudanum poisoning in two male twin infants, three months old, both of whom were in a state of profound coma when Physick saw them. He says:

"Under these circumstances it clearly appeared no time was to be lost, and therefore, as they could not swallow anything I determined to inject an emetic into their stomachs. For this purpose a large flexible catheter was passed through the mouth down the œsophagus into the stomach, and through this, one drachm of ipecacuanha mixed with water was quickly injected by means of a common pewter syringe."

After several trials, in which the different fluids ingested were withdrawn by applying a syringe to the projecting end of the catheter, good breathing and heart action was brought about in the little patients, only one of whom, however, recovered. In a footnote on p. 112, Physick says:

"The idea of washing out the stomach with a syringe and tube, in cases where large quantities of laudanum or other poisons had been swallowed, occurred to me at least twelve years ago, and I have constantly, for many years, recommended it in my lectures. In the year 1809, Dr. Dorsey performed the operation of washing out the stomach in such a case, but the patient had taken the poison twelve hours before he was called, so that he did not succeed."

In a subsequent note in the same journal (pp. 380-381), Physick adds:

"I have the pleasure of announcing to you and to your readers, that in several instances which have recently occurred in this city, the practice has been completely successful.—In two cases treated by Dr. Dorsey, in which large quantities

of laudanum had been taken, there is great reason to believe that no other mode of treatment would have succeeded in preventing the fatal event. Both patients were saved by injecting warm water into their stomachs, and extracting it again, together with the laudanum, by means of a syringe.

"I therefore am happy in having called the attention of the profession to a mode of treatment not before used in this country, at least within my knowledge; but I have now an act of justice to perform in ascribing the merit of the invention to Dr. Alexander Monro, junior, of Edinburgh, who published it in his inaugural thesis, in A.D. 1797. Of this circumstance I was entirely ignorant when I sent you my paper, and probably should still have remained so, had it not been mentioned in his book of *Morbid Anatomy*, a work which has but very lately come into my hands."

Thus, while Physick was the first to pump out the stomach in a case of poisoning, he very modestly renounces his claims to the invention of the instrument in favor of the Monros. In *Ludwig Darmstaedter's* valuable "*Handbuch zur Geschichte der Naturwissenschaften und der Technik*" (1908), it is stated (p. 1822) that "the English surgeon F. Bush first emptied the contents of the stomach in a case of opium poisoning by means of a suction pump provided with a gastric sound." But Physick's priority in the matter apart from his papers of 1812, is attested by the following affidavits, published in the *Medical Recorder* (Philadelphia) of October, 1826 (pp. 325-326):

No. 1.

I do hereby certify, that in the years 1802, 3, and 4, I attended Dr. Physick's lectures upon surgery, and heard him recommend the introduction of a tube into the stomach, in cases where poisonous substances had been taken, through which tube, fluid might be injected by a syringe and extracted again; thereby enabling the practitioner to remove such noxious substances from the organ.

(Signed)

ISAAC CLEAVER.

Philadelphia, June, 1820.

No. 2.

I do hereby certify, that I attended Dr. P. S. Physick's lectures on surgery in the years 1805, 6 and 7, that, in these lectures, the doctor exhibited a tube coated with elastic gum brought by Dr. Dorsey from Paris, and made there by Dr. Physick's order, long enough to reach from the mouth into the stomach. With such a tube, Dr. Physick advised to inject water or other fluids into the stomach, and draw them back again by the aid of a syringe. In cases where laudanum or other poisons had been swallowed, and thereby to work them out of the stomach and introduce counter agents.

(Signed)

JOHN D. THOMAS.

Philadelphia, June, 1820.

No. 3.

I remember that, in the winter of 1808-9, Dr. Physick informed me that he had an elastic tube,

brought from Europe by Dr. Dorsey, for the purpose of injecting fluid into the stomach, and drawing it out again, in order to wash out poisonous substances, such as opium, etc.

(Signed) BENJAMIN S. JENNY.

Philadelphia, June, 1820.

"In the year 1803, Dr. Dorsey was in Paris, and had made, by Dr. Physick's order, a tube of the kind now generally used, constituted of the same materials as the French catheter, and resembling it, except in size. That the use for which it was designed was unknown in Paris previous to that period, is evident from a letter from Dr. Dorsey to Dr. Physick, dated 1803, and now in the possession of the latter, in which he states that the makers were curious to know what was the intention of so large a catheter. It was not long before they ascertained the point, and tubes have been since regularly imported from there, for the supply of physicians in the United States."

In the *London Medical and Physical Journal* of September and November, 1822, respectively, we find two articles on the removal of opium and other poisons from the stomach by means of a flexible tube, by Francis Bush of Frome (Somerset)⁹ and Edward Jukes of Westminster.¹⁰ England, Jukes, however, claims to establish priority over Bush by a citation from an unnamed periodical, dated May 29, 1822. Both papers refer to cases of opium poisoning. Bush calls his instrument a "gastric exhauster" and describes it as follows:—

"The instrument consists of a common syringe, with a flexible tube fitted to it, of length sufficient to allow one end to enter the stomach; it may be formed of leather, or of the same materials as the elastic flexible bougie (the same syringe should have these tubes of different sizes, to suit the various subjects who might require their use); the ordinary circumference of it would be from an inch to an inch and a half; the point destined to enter the stomach should be smooth and furnished with holes, like the catheter; these holes should be four, or six in number, and as large as the tube will admit of. By attention to this part of its construction, even the more solid, as well as the fluid, contents of the stomach will be brought from it, when the piston is made to act. The syringe and the tube should not be permanently fixed, but so constructed that they can be put together and separated instantaneously; and a flexible rod of whalebone should accompany the tube, to give firmness to it in entering the stomach, but should be withdrawn before the syringe is fixed."

Jukes's instrument is of similar character, with the exception that he employs an elastic bottle instead of a syringe for pumping. With this apparatus, he made a number of successful experiments on dogs purposely poisoned with opium, and even went the length of performing similar experiments upon himself. In 1823, an

improved stomach pump, invented by Mr. Reed, of Hosmonden Lane, Kent, was introduced with success in the wards of Guy's Hospital, through the good offices of Sir Astley Cooper. In lecturing on opium poisoning and upon the use of Reed's instrument at Guy's, Sir Astley said:

"We are indebted for it to Mr. Jukes, a Surgeon at Pimlico, who published an account of it in the *Medical and Physical Journal* for November, 1822, p. 285; and a further account in the same Journal for June, 1823. Mr. Jukes originally employed a gum elastic bottle to be applied to the tube; but the improvement of a syringe was suggested by Mr. Bush, of Frome."¹¹

With this lecture, the stomach pump was permanently introduced into English practice, and improvements in its construction were only a matter of time. In the same period were published the pioneer English works on toxicology by Addison and Morgan (1829) and Sir Robert Christison (1829), which followed Orfila's great treatise of 1813-15.

In Maupassant's "Mont Oriol" there is a satirical description of the passage of a stomach tube, in which the patient "with staring eyes, purple cheeks, lips covered with foam, panted for breath, gasped as if he were suffocating, and had agonizing fits of coughing; and clutching the arms of the chair, made desperate efforts to get rid of this beastly tube which was piercing his body"—the doctor all the while exhorting him to "Cough! cough! in order to facilitate the descent!" This grotesque and very flippant caricature of a simple procedure—a good example of "how not to do it"—may at least serve to remind us that the idea of a stomach-pump or tube must have occurred to many in the past, but the difficulty of passing the instrument without much practice probably retarded its earlier introduction. The tube itself was nothing; the mastery of the technic of passing it everything.

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- ³ Rüssmaul: *Tagebl. d. 41. Versamml. deutsch. Naturf. u. Aerzte*, 1867, 41-42.
- ⁴ Ἡ γὰρ δὲ πλήρωσιν κενῶν τῶν Ἐρασιστρατεῖω καθήκει, ἔστι δὲ οὗτος προσευκὴς φαρμακικὴ σίλμα'ό.
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RINGWORM OF THE HANDS AND FEET.

BY J. E. LANE, M.D., NEW HAVEN, CONN.

CASES of ringworm of the hands and of the feet have been occasionally recognized for many years, though the first important report of cases of this condition was made by Pellizari in 1888. He reported seven cases of ringworm of the hands, in two of which the palms alone were affected. There was no affection of the scalp or other parts of the body in any of them.¹

In 1892 Djelaleddin-Mouktar gave the first precise clinical description of the disease and reported twenty-five cases, sixteen of which were on the hands and nine on the feet.²

In 1910 Sabouraud called attention to the fact that eczema marginatum frequently affects the feet and occasionally affects the hands.³ A little later he stated that eight out of ten of the so-called eczemas of the feet are really parasitic and that "the interdigital spaces of the toes are really the most frequent location of eczema marginatum of Hebra."⁴

In spite of the descriptions of the disease that have been published, it is still not very well known. Hartzell says that "the profession, with the exception of those specially concerned with cutaneous diseases, is as yet quite unaware of its existence, and failing to recognize its parasitic nature, fails completely in its treatment."⁵

There are few statements as to whether the hands or the feet are more frequently affected, but it is probable that the feet are much more often the location of the disease than are the hands. Four cases were seen by Hartzell in the last few years. Three were on the feet and one on the hands. Sutton, who would not overlook this disease in the discussion which followed a recent excellent and excellently illustrated paper on palmar eruptions, stated that "the condition (of ringworm of the hands) must be a somewhat rare one. Up to the present I have never encountered a case in America or elsewhere."⁶

The nails are still more rarely affected, though according to Heller, whose experience with diseases of the nails is probably unequalled, such a diagnosis is not infrequently made. He says, "I remember having seen only two cases in the last fourteen years in which I was able to demonstrate the fungi in the nails. A great number of nail diseases came to me from colleagues with the diagnosis of trichophytosis without my being able to find the trichophyton."⁷

Marie Kaufmann-Wolf has recently made an important contribution to the knowledge of ringworm of the hands and feet, which indicates that it is much more common than has hitherto been thought to be the case.⁸ The cases studied were clinically dysidrosis (pompholyx). In about a third of the cases, seen by her during seventeen months in Paris, Vienna and Berlin, clinically diagnosed as dysidrosis, the diagnosis of ringworm was established by microscopical examina-

tion. There were twenty-five cases so diagnosed and the fungi were grown in all but three cases. In seventeen of the twenty-five cases a hitherto undescribed trichophyton was found. This has not yet been definitely classified, but Wolf, Sabouraud and Plaut are of the opinion that it is a fungus of animal origin, closely related to the trichophyton equinum. This would also seem to indicate that in this type of cases the epidermophyton inguinale, which was found only twice, is not the most frequent cause of ringworm of the feet, although the statement of Sabouraud still holds good: that this variety is much more common on the feet than on the hands. However, the question as to what varieties of fungi cause these conditions is of scientific interest. The important point for the clinician is the fact that they are not very infrequent and that they present very varied appearances.

Ringworm of the Foot. Mrs. M. was referred to me in October, 1915, by Dr. L. W. Bacon for an eruption on the sole of the right foot. A little in front of the middle of the sole of the foot were two or three minute, firm, deeply situated vesicles and, near by, one larger one which was distended with cloudy fluid. On the outer side of the dorsal surface of the foot there was an irregular slightly scaly patch about two inches long and an inch in width. The scales were fine, the patch was not sharply outlined, the edges were not elevated. It was so slightly marked that it might easily have been overlooked. On the rest of the foot there was no evidence of any previous eruption. The skin of the interdigital spaces was perfectly smooth and of normal appearance. Large numbers of fungi were found without difficulty in the scrapings from this patch.

Ringworm of the Hands. Mrs. P., aged 28, was seen in October, 1915, at the Dermatological Clinic of the Yale Medical School. Both hands were affected, and the accompanying illustrations make a description of the lesions unnecessary. In this case the appearance was typical of trichophytosis, and the clinical diagnosis was so made. Fungi were found in scrapings from both hands, but with some difficulty. The search for fungi in scrapings from the affected nails was unsuccessful, though made at several different times. The history of this case is of some interest. The patient was married at 13, and had six children, of whom the first three are living. The last three died about one month after birth. She was married the second time about three years ago. Since that time she has had seven miscarriages at periods varying from the second to the seventh month of pregnancy. The eruption on the hands began about three months before she was seen. It started with the appearance of small vesicles in the center of the right palm. The other hand was affected in the same way shortly after. The exfoliation began soon and the affected areas grew rapidly larger. As the eruption on the nails is continuous with that on the fingers affected, and as it is not found on the nails of the unaffected fingers, there is little doubt that the disease of the nails is also trichophytosis, in spite of the failure to demonstrate the fungi. Nevertheless, with such a history, the possibility of syphilis of the nails was



FIG. 1.



FIG. 2.

considered, in spite of the negative Wassermann reaction and the absence of any other clinical signs of syphilis.

Diagnosis: The cases of ringworm of the hands and feet which present the typical classical picture of a nearly circular eruption with an elevated, vesicular border and a center which tends to heal, are few. When such a picture is presented, as in the case of ringworm of the hands described, the clinical diagnosis is fairly certain. In most cases such a diagnosis is impossible, though in a certain number of cases there are some less distinctive signs which should suggest the possibility of the presence of ringworm. Intertrigenous affections of the toes which extend toward the plantar surface of the foot are always suspicious. Eruptions resembling a limited vesicular eczema, whether on the hands or on the feet, should not be dismissed as an eczema without consideration of a trichophytic origin. Kaufman-Wolf's study demonstrating the fact that many cases of clinical dysidrosis are in reality trichophytosis, shows the importance of the investigation of every case of this disease with this possibility in mind. The points which she mentions

as of assistance in making a clinical diagnosis of ringworm in such cases are, the acute onset of the affection especially in the warm weather, the constant accompaniment of itching, the usual locations on one hand or one foot; though there are numerous exceptions to the unilateral location, the interdigital location, when on the foot, with extension toward the plantar surface, frequent extension toward the inner border of the foot, the deeply placed vesicles with a tendency to grouping, to confluence, to rapid pustulation and their slight tendency to oozing.

In many cases there are no signs which especially suggest the condition. In all doubtful cases of eruptions on the hands and feet a microscopical examination should be made. The technic is simple. Loose scales from the edges of the eruption, and the tops of the unbroken vesicles should be chosen as the fungi are usually more abundant in those locations. The scales or a small piece of skin is placed on slide, one or two drops of a 20% to a 40% solution of potassium hydrate is added and covered with a cover glass. The slide is heated over a flame till bubbles appear in the solution. If necessary this is repeated until the scales are soft enough to be easily disassociated by slight pressure on the cover glass. There is usually less difficulty in finding the fungi from lesions on the feet than from those on the hands, as conditions on the hands are less favorable to their growth and the more exposed location and frequent washings mechanically remove the superficial ones to a considerable extent.

Treatment: The mechanical removal of the superficial layers of the skin is an important part of the treatment. This is well accomplished by soaking and then scrubbing with a moistened cake of pumice stone or coarse sand soap. Sabouraud says that on the hands this treatment is more useful than antiseptics, and that the lesions can be cured by this treatment alone in most cases.⁹ As an antiseptic application he recommends a 1% solution of iodine in 60% alcohol. On the feet a similar treatment is used but the solution of iodine is employed from the start. If this is not successful, a 1% chrysarobin ointment is applied. Hartzell recommends the ointment suggested by Whitfield, which is composed of 3% salicylic acid and 5% benzoic acid. After there is apparent cure the treatment is suspended for a week and then resumed for a few days with view of destroying any fungi that may have escaped. If dermatitis is caused by the antiseptics used, they are replaced by a soothing ointment until it has subsided.

In cases in which ringworm may be suspected, but in which it is impossible to demonstrate fungi, it may be wise to try such treatment, for a trichophytosis, treated as an eczema, or untreated, will continue indefinitely. Sabouraud mentions having seen one case of more than three years' duration.

Ringworm of the nails is exceedingly difficult

to cure. The best treatment appears to be to scrape the affected parts of the nails frequently, and to keep an antiseptic ointment applied as constantly as possible.

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WHAT GOITERS DEMAND OPERATION?

BY FRANK H. LAHEY, M.D., BOSTON,

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FROM a considerable experience in this locality with goiters, I have observed that many physicians still look upon goiter as a disease in itself, and are not completely familiar with the varieties and the indications for operation in each group. With this in mind, I have undertaken to point out in the following paragraphs the types of goiter that are best treated by surgical measures and the types not demanding this form of treatment.

In the first place, it should be clearly understood that goiter in itself means little or nothing so far as describing the disease goes. It signifies only that there is sufficient enlargement of the thyroid gland so that its prominence is noticeable upon the neck. This we know is but one sign of thyroid disease. Much of the confusion in the minds of those physicians, who have not followed the advancement in diseases of the thyroid in the last few years, is due to a misunderstanding of this term.

The thyroid gland is subject to the following changes from a clinical point of view:

¹ Thyroiditis

Enlargement (symmetrical or asymmetrical) without toxic symptoms (simple goiter, colloid goiter)

Enlargement (symmetrical or asymmetrical) with symptoms of hyperthyroidism (hyperthyroidism or exophthalmic goiter)

Cysts

Adenomata

Carcinomata and sarcomata.

¹ Under a pathological grouping, a much more extensive division, according to tissue or secretion changes, may be made. For the purpose of classifying clinically for the practitioner I have used here only the simplest clinical grouping.

Thyroiditis occurs chiefly in the presence of infections elsewhere in the body. In the three cases which I have seen, abscess formation has occurred but once, and in that case it was impossible at the time of incision to be certain that the pus was not outside of the thyroid gland. It is obvious that surgical treatment will rarely be necessary here, and when so, only in the form of incision and drainage.

Symmetrical enlargement without toxic symptoms usually occurs in young girls soon after the establishment of the menses, and it is this type of goiter that I frequently have sent to me under the mistaken assumption that all goiters demand surgical intervention. The enlargement may be somewhat greater in one lobe than the other, and the gland upon palpation is fairly firm. Provided there are no symptoms of hyperthyroidism, this type of goiter in no way demands surgery, but should be submitted to medical treatment,² and a careful watch kept for the onset of symptoms of hyperthyroidism, when an operation should be advised.

Colloid degeneration may also produce enlargement of the thyroid, which is more or less symmetrical, although one lobe is frequently enlarged more than its neighbor. The gland in this case is usually soft on palpation. The condition is the result of a retention of some of the elements of the thyroid secretion. This type of goiter may be submitted to surgical treatment because of its unsightly appearance, because of pressure symptoms, or because it has persisted for a long time.³

Enlargement involving the whole gland, or, what is more common, the whole gland, but more particularly the right lobe, with symptoms of hyperthyroidism, are best submitted to surgical treatment in the form of ligation or partial thyroidectomy as early as possible. In this group it should be remembered that the so-called cardinal symptoms of hyperthyroidism—goitre, exophthalmos, tachycardia and tremor—need not be and frequently are not all present. It should be remembered that the presence of two of these symptoms with or without some of the secondary symptoms, such as nervousness, diarrhoea, sweating, etc., should suggest strongly the existence of this disease and even the presence of an unexplained tachycardia be looked upon with suspicion. This group of cases should be subjected to surgical treatment as soon as the diagnosis can be made with certainty.

Cysts of the thyroid, when of sufficient size to be noticeable, are usually single, and should be submitted to surgical operation for the following reasons: because of their unsightly ap-

² Small doses of iodides or thyroid extract have been said by some to have benefited this type of case. It should be remembered, however, that these drugs should never be administered in the presence of hyperthyroidism, and that by some they are said to predispose, or bring about, that condition.

³ It is said that with the advent of a hyperemia in a thyroid showing colloid degeneration, the colloid may be so diluted or changed in consistency that it becomes absorbed. I have never had an opportunity to observe this phenomenon, but there is no doubt that spontaneous disappearance occasionally occurs in several forms of goiters.

pearance, because of pressure (upon the trachea, vessels or nerves), because they are intrathoracic, or may become so. I wish here to call attention to the fact that a very large intrathoracic cyst or adenoma may be present while there appears but a slight enlargement in the region of the thyroid gland, represented by the top of the cyst as it appears above the clavicle or sternal notch. This is the type of case which is often overlooked by the physician, or told that his goiter is not of sufficient size to be of importance. I wish to further call attention to the fact that these intrathoracic goiters may exist with but occasional interferences with respiration or circulation.

In the past year I have had one case in which there was a visible goiter of but very moderate dimensions. The patient had had but one attack of suffocation coming on while alone at a hotel. He recovered from this without treatment, and was later sent to me by his family physician for operation. Before the operation could be undertaken, he became cyanotic and unconscious, so that I operated upon him without anesthesia (while he was unconscious). A large cyst, whose lower pole rested upon the arch of the aorta, was evacuated, the pressure relieved, and the man returned to consciousness. The sac was then removed and recovery resulted. I cite this case as one of several intrathoracic goiters to indicate how serious may be the consequences of too lightly passing over what seem to be small localized enlargements of the thyroid gland.

Adenomata of the thyroid may be single or multiple, and, like cysts, should be submitted to surgical operation for the same reasons—(unsightly appearance, pressure, and intrathoracic location)—with the added danger that they may at any time become malignant.

In the case of cysts and adenomata, it should be remembered that symptoms of hyperthyroidism as a result of pressure from the cyst or adenoma may arise at any time and operation then be indicated.

Carcinoma and sarcoma of the thyroid gland, to be benefited to any extent by surgical measures, more than in almost any other part of the body, must be submitted to early surgical treatment, and then even under the most favorable conditions the prospect of early recurrence is great. This constitutes an argument in itself which should lead us to investigate and remove all suspicious localized swellings of the thyroid gland.

To sum up, the indications for operation upon the thyroid are as follows:

1. For hyperthyroidism (exophthalmic goiter).
2. For pressure (either extra or intrathoracic).
3. For removal of unsightly enlargements.
4. For malignancy or possible malignancy.

THE TREATMENT OF PSORIASIS WITH HORSE SERUM.

BY ARTHUR P. PERRY, M.D., BOSTON,
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THAT psoriasis is a disease often most rebellious to treatment is a fact well known to every practitioner, be he a specialist or not; therefore any remedy which holds out the hope of alleviation or cure is gladly received. Within the last year or two, various attempts have been made to get the better of the disease by intravenous injection of the patient's own serum. No clear or cogent reasons are given for this procedure, its employment being entirely empirical, also there seems as yet to be no consensus of opinion as to its efficacy. Gottheil, a worker in this field, asserts "that blood serum, whether autogenous or foreign, undergoes important changes after it has been withdrawn from the body. The administration apparently diminishes the sensitiveness of the skin so that there is less tendency to persistence and spread of the local symptoms and ordinary medication is more effective and can be pushed without exciting reflective inflammatory phenomena."

Horse serum is essentially of the same composition as human serum, has been administered for years subcutaneously, being the medium for the antitoxin of diphtheria, and used as well as rabbit serum in the treatment of hemophilia. It therefore seemed to be worth while to try it in cases of psoriasis, and quite probable that it would act similarly to autogenous serum. Autogenous serum is prepared by withdrawing 75 to 100 c.c. of blood from one of the patient's veins, placing it in an electric centrifuge for 30 minutes or so, decanting the serum and injecting 30 c.c. into a vein. The whole process naturally must be conducted with great care as to sepsis. This presupposes laboratory conveniences, which are not always at hand, and the operation in any event takes considerable time. With this in mind, we have during the past summer, experimented with normal horse serum in cases of psoriasis. The term normal is used here advisedly, the serum being obtained from the blood of normal horses as distinguished from that from horses undergoing the process of immunization for the production of curative serum. The serum is furnished in aseptic glass syringes ready for use. It is not always clear as seen through the glass, but a competent serologist assured us that this was probably due to red blood cells and would make no difference in the reaction. This fact has also been remarked by clinicians. Accordingly, six cases of psoriasis in which the disease was well marked were given horse serum at weekly intervals during six weeks, all other treatment being omitted that its effect might be estimated.

At first the serum was given intravenously, but after two cases of anaphylaxis had occurred, one of which was most startling, the remainder was administered subcutaneously.

The patient who developed serious symptoms of anaphylaxis was a man of 35, of good physical appearance and habits, who had one intravenous injection without trouble. The second injection was followed by considerable pain in the arm, necessitating a visit from a physician in the evening after returning home. One week later, having received the third injection at the hands of an unusually intelligent house officer, he suddenly turned black in the face, his breathing became rapid and stertorous with a rapid and feeble pulse. A second case, a woman, developed similar symptoms, though in much less degree.

These occurrences led us to omit the serum altogether in the anaphylactics and to adopt the subcutaneous route in the others. The results in this series were inappreciable to ourselves, though the patients were unanimous in their claim that the psoriasis was less marked and locally attended the clinics.

Two private cases, one of which received the serum while taking a course of Liq. Potass. Arsenitis, while the other was given Ung. Acid Salicylici, improved greatly, the first result being the almost total disappearance of the psoriasis, and while the other is still under treatment, the patches have disappeared entirely, leaving only a faint stain. Among other cases receiving the serum was a woman of 40, who had been suffering from pemphigus for at least six months. She had been treated in two hospitals as well as privately, without result. She was given an injection of horse serum once a week subcutaneously, as it was impossible to enter a vein. Although she was in a feeble condition, no untoward results occurred. In fact, though before the administration of the serum the characteristic bullae of the disease were of frequent occurrence, every portion of her body having been attacked, even the mouth and vagina; since the injections none have been seen now for some six weeks. This experience with horse serum though not large, tends to show that the results of its trial accord with those obtained by others with autogenous serum, viz.: that serum, either autogenous or exogenous, is of little value in psoriasis when given alone, but that when combined with local or internal treatment, it for some unknown reason exercises a favorable influence on the disease. An advantage which the use of horse serum has over the autogenous product is that the patient is saved the operation of withdrawal of his blood and the administrator the time and trouble of the preparation of the serum, since horse serum can be obtained ready for immediate injection. It would seem that this remedy should be extensively tried out.

(Since preparing this report, another case of psoriasis of several years' standing, treated with six subcutaneous injections at weekly intervals, has been apparently cured, the eruption having entirely disappeared.)

PHYSIOLOGICAL CONSIDERATIONS IN THE DIFFERENTIAL DIAGNOSIS OF NEURASTHENIC, HYSTERICAL, AND PSYCHOTIC SYMPTOMS.*†

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Boston Psychopathic Hospital.*

THE autonomic, or vegetative nervous system, innervates the glands and the smooth muscles of the viscera, which, as far as is now known, are never innervated directly from the central nervous system. Under the control of the autonomic system are to be found the tear gland, the dilator of the pupil, the muscles regulating the arteries of the salivary glands, hair, surface arteries, sweat glands, heart, liver, stomach, spleen, intestine, adrenal glands, colon, bladder, rectum, and the arteries of the external genitals.

Dejerine and Gauckler, in their book upon the psychoneuroses, have chapters dealing with the following subjects: The Functional Manifestations of the Digestive System; The Functional Manifestations of the Urinary Organs; The Functional Manifestations of a Genital Nature; The Functional Manifestations of the Respiratory Apparatus; The Functional Manifestations of the Cardio Vascular Apparatus; Cutaneous Functional Symptoms (Vasomotor, Secretory, and Tropic); Functional Symptoms in the Neuro Muscular Apparatus; Disturbances of Sensibility; Functional Manifestations of the Sense Organs; Nervous and Psychic Manifestations (sleep, headache, etc.)

Janet, in his book, "The Major Symptoms of Hysteria" considers in various chapters, Somnambulisms, Double Personalities, Convulsive Attacks, Motor Agitations, Contractures, Paralysis, the Troubles of Vision, the Troubles of Speech, the Troubles of Alimentation, (Anorexia, Paralysis of Lips, Tongue, Pharynx, Oesophagus, and Abdomen) Ticks of Respiration and Alimentation.

A comparison of these two books shows that in the first, wherein neurasthenia is considered for the most part, the symptoms deal almost entirely with the field innervated by the autonomic nervous system, whereas, Janet deals with symptoms which are almost without exception in the field controlled normally by the central nervous system,—symptoms, which, for the most part, are capable of being voluntarily imitated.

The study of the psychoneuroses cannot but be benefited by clarity of distinction between what is meant by neurasthenic symptoms and what is meant by hysteric symptoms. It would seem, accordingly, to be worth while if a sharp differentiation on a physiological basis could be made between these two classes of symptoms, and if cases showing symptoms involving principally the central nervous system could be

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† Read at a meeting of the Boston Society of Psychiatry and Neurology, held November 18, 1915.

classed as hysteria, while cases showing symptoms acting principally through the autonomic system could be termed cases of neurasthenia. Of course, such a differentiation of symptoms need not imply that a given case of hysteria has no neurasthenic symptoms, or that a given case of neurasthenia has no hysterical symptoms. As is well recognized, a case very commonly may have symptoms of both a neurasthenic and an hysterie type. If, however, a distinction between neurasthenic and hysterie symptoms can be clearly made on a physiological, or an anatomic basis, much confusion and loose use of terms will be avoided.

In seeing psychotic cases, however, whether of dementia praecox, general paralysis, or manic depressive insanity, one is struck by the lack of correspondence between the emotional condition and many symptoms involving the autonomic system. Delusions of food pollution, etc., do not seem to cause nausea or interfere with the digestion. In the midst of a profound depression, nutrition is often maintained surprisingly well. Frightful fears are often experienced with little modification of pulse rate, etc. Etherization sometimes produces little somatic reaction. A general parietic reacts little or not at all to a lumbar puncture. In fact, changes in affectivity involving the autonomic system are seemingly a common occurrence. Whether a break between the central nervous system and the autonomic system occurs when a psychoneurosis turns over into a psychosis, is an interesting question. At least, a suggestion of such a possible break has been recognized as a change in affectivity and such a change in affectivity has been recognized as of value in prognosis and diagnosis.

The suggestion is here made that neurasthenic, hysterie, and psychotic symptoms are possibly to be distinguished from one another on physiological grounds based upon a differentiation between symptoms involving mainly the voluntary nervous system as in hysteria; symptoms involving mainly the autonomic system, as in neurasthenia, and symptoms showing possibly a break between the emotional activity of an individual and his autonomic nervous system as in a psychosis.

Clinical Department.

REPORT OF A CASE OF CHRONIC NEPHRITIS WITH UREMIA.

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IOWA CITY, IOWA.

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In the course of a routine examination of the urea and non-protein nitrogen of the blood in

renal disease we happened upon the following case, a detailed report of which may be of general interest:

A baggage agent, aged 46, entered the hospital on September 22, 1913, complaining of vertigo and difficulty in walking. Eight months previous while at work he suddenly became dizzy and was compelled to remain in bed for ten weeks suffering from delirium and drowsiness. The left leg and forearm were numb at the time, there was partial loss of memory, difficulty of speech and vomiting. No previous history of lead poisoning, syphilis, alcoholism or scarlet fever could be obtained.

On examination the right pupil was slightly enlarged and sluggish and the fundi showed exudates and hemorrhages. The heart was enlarged, a faint systolic murmur was audible at the apex; the aortic second sound was accentuated at the base. The pulse was large and regular. The systolic blood pressure was 180 and the diastolic 120 millimeters of mercury. Both brachial radial and temporal arteries were tortuous and hardened. The urine averaged 1500 cubic centimeters but often exceeded two liters in volume, was of low specific gravity and contained albumin, casts and blood. The Wassermann reaction of the blood and cerebro-spinal fluid was repeatedly negative. No edema could be demonstrated at any time.

The patient remained in the same general condition for a time, the blood-pressure was persistently high in spite of treatment. In March, 1914, nocturnal dyspnea became pronounced, then mental symptoms developed culminating in uremic convulsions with profuse diaphoresis and chills. A partial cataleptic state followed and the patient died on April 11, 1915.

His blood* was repeatedly examined for non-protein nitrogen and urea nitrogen according to Folin and Denis (*J. Biol. Chem.*, 1912, Vol. II, p. 527); these figures together with the blood pressure and urinary findings are charted below.

While the patient was receiving a diet exceedingly low in proteins consisting of cereals, jellies and six ounces of milk per day, two 24-hour specimens of urine were obtained quantitatively, and preserved under toluol in the refrigerator. On March 14 the patient excreted 9.38 grams of nitrogen, of which 7.85 grams was in the form of urea nitrogen. On March 15 8.41 grams of nitrogen were passed of which 7.38 grams was in the form of urea nitrogen and 0.68 grams in the form of ammonia nitrogen.

Abstract of Autopsy Report (Dr. C. E. Royce). The heart showed hypertrophy and atheroma of the coronary vessels. The kidneys were of average size, weighed 150 grams, surface slightly scarred although the capsule stripped readily. The cortex measured 4 mm. and the medulla 12 mm. The markings showed fairly well. Microscopically, there was an excessive amount of connective tissue, thickening the walls of the vessels and Bowman's capsule, replacing many glomeruli and effecting the usual tubular appearance. Although diffuse, the newly formed tissue was most marked in the region of the arcuate vessels. The epithelium presented various degrees of degeneration especially in the medulla.

The low urea and non-protein nitrogen content of the blood (within normal limits) even during the height of the uremic convulsion is interesting as

* The blood and urine analyses were made by Dr. C. W. McClure, clinical microscopist to the University Hospital.

Date.	Phenolsulphonophthalein Excretion.	Total N. P. N. Mgs. per 100 Grams of Blood.	Urea N. Mgs. per 100 Grams of Blood.	Blood Pressure.
1914.				
Jan. 12.....	37% in 2 hours			220
Feb. 3.....		35.0	21.2	200
Feb. 12.....		29.2	18.7	210
Feb. 23.....		30.2	20.2	230
Feb. 26.....		29.8	15.3	220
Mar. 1.....		27.5	16.3	208
Mar. 4.....	22% in 2 hours		15.0	205
Mar. 5.....		29.8	15.0	205
Mar. 8.....		28.0	15.3	190
Mar. 16.....	16% in 2 hours			
Mar. 20.....		31.6	17.2	150 (During uremic convulsions)
Mar. 30.....		33.4	18.4	180
Apr. 7.....	22% in 1 hour	34.5	24.6	174

illustrative of that type of what is clinically known as uremia, where the *character* of the substances retained seems to be of more importance than the total quantity of urea and non-protein nitrogen. The phenolsulphonophthalein excretion indicated a moderate degree of retention. Unfortunately the total nitrogen of the low protein diet which the patient received, was not determined, but an excretion of from 8 to 9 grams of nitrogen through the urine on such a diet must be considered ample.

This case occurred in the service of Dr. C. P. Howard, to whom we are indebted for the clinical studies.

Medical Progress.

PROGRESS IN GYNECOLOGY.

By STEPHEN RUSHMORE, M.D., BOSTON.

CANCER AND OPERATION.

ALTHOUGH in the opinion of some enthusiasts radium is destined to supplant operation entirely in the treatment of cancer of the uterus, the actual basis of fact is not yet sufficient to carry widespread conviction as to the soundness of this view. Many operators still think there is a field for the radical operation, and Cobb¹ reviews the work on cancer of the uterus at the Massachusetts General Hospital in recent years, and gives a comprehensive presentation of the chief points in the operative technic. The radical operation is formidable and not to be lightly undertaken by the tyro, but in the hands of competent men it has given better results than any other method, in spite of the high initial mortality.

Cobb emphasizes the great care, from every point of view, that these patients demand, in order to shorten the time of operation, prevent shock, save blood, avoid infection and implantation metastases.

In his series are 367 cases, with an operability of 36.2%. The average duration of symptoms was about one year, but attention is called to the fact that the growth may have passed beyond

the stage of operability when the first symptoms appear. Cobb's figures for cases done over five years ago are small, six in all, in which the more extensive operation was performed, of whom five are well.

The combination of ether with spinal anesthesia Cobb deems very satisfactory. The growth is curetted and cauterized at the time of the radical operation or a few days before. The care of the ureters is important; they must be handled a good deal and freed for a considerable portion of their course in the pelvis. There is weighty objection to the use of ureteral bougies or catheters during operation. To avoid injury when the ureters are once freed, Cobb lifts them with tapes. The tying of the internal iliac arteries, a procedure which has been somewhat revived of late, is advocated and employed especially in the case of ineradicable growths. After the uterus is removed and all the vessels are tied the peritoneal cavity should be closed off entirely from the field of operation and the extraperitoneal raw area should be drained by a small piece of iodoform gauze which does not come in contact with the ureters. Salt solution is given freely by the rectum, and the bladder is cared for by the use of urotropin and an indwelling catheter. Cobb has seen no postoperative necrosis of the bladder.

It has been the custom to avoid secondary operations in cases of recurrence of carcinoma of the uterus. Especially is this true if a radical operation, abdominal or vaginal, was performed primarily. That this is not the best plan is suggested by Zweifel², who advocates secondary operations. It is true that at times the recurrence comes to the surgeon's attention too late for removal. But often only an exploratory operation will show conclusively whether removal is or is not possible. The principles in accordance with which the question should be decided, laid down by Franz and quoted with approval by Zweifel, are: the tumor or recurrence must be sharply defined on all sides, and only a small part of its periphery may be attached to the pelvic wall; involvement of the bladder does not preclude operation; immobility of recurrence is often due to connective tissue and not to actual tumor growth. It is to be remembered also that often

the growth has gone farther than can be made out clinically.

Zweifel reviews the literature of all the cases reported and presents a brief critique. He finds twenty cases in which secondary operation was possible and which could be traced up to the time of the report. In three of these, no recurrence was found on microscopical examination of the nodule removed. Thus seventeen cases only remain to be considered. Of these, five survived operations for periods from four years and five months to ten years and eight months. One of these patients underwent five operations for recurrence and, at the age of seventy-five, was free four and one-half years from the latest. Three cases died as the result of operation, one of septic peritonitis, the second of an abscess which burrowed from the abdominal incision, and the third on the fifty-third day from embolus following phlebitis of the left leg.

This high percentage of cures in those cases in which exploratory operation showed removal to be possible, suggests the advisability of more frequent resort to such method of treatment.

CANCER AND RADIUM.

Much has been written on the use of radium in the treatment of cancer of the uterus, but the known results can be stated briefly. Ransohoff³ advocates its use in inoperable cases, where it gives great relief. Some of these cases may prove later to be cured. He does not accept Kroenig's dictum that it should be used in every case to the exclusion of operation, though all acknowledge that the five-year limit only will show the final test.

The line of treatment laid down by Ransohoff is in accord with the practice of most operators at the present time,—to operate in cases in which the growth seems eradicable. While not in favor of pre-operative radiation on account of material increase in the difficulty of operation, he advocates post-operative treatment as a prophylactic measure against recurrence. If radium is effective for three and one-half centimeters only, even this range of applicability would cover most of the operable cases. If the carcinoma has advanced more than this distance the case is a borderline case, one of those which the surgeon so often wishes he had not attempted when he gets down to the growth.

The report of the Radium Institute of London is to be recommended to those who desire detailed information and conservative views. An abridged report has been published giving a summary of the work of the past year. Pinch⁴, the medical superintendent, says cancer of the uterus is very favorably affected by radium, both in inoperable and in operable cases, though it is not proper to speak as yet of a cure. Post-operative recurrences in the vagina are also favorably influenced. But if extensive operation has been carried out, great care is necessary in the post-operative use of radium, employing

smaller amounts and thicker screens. Unless these precautions are observed, a severe and extensive destructive reaction may follow. This may be attributed to operative interference with the trophic nerves in the pelvis. If radium has been applied to the vagina, douches should be used night and morning for six weeks, at least, to prevent adhesive vaginitis. In some extremely susceptible cases a transient proctitis has been noted after the intra-vaginal treatment. For details of technic, reference must be made to original sources.

Von Seuffert's⁵ experience in the treatment of cancer with radium, has been chiefly with reference to the treatment of cancer of the uterus, and he aims to give a fair statement of the present status of radium therapy as far as it is concerned with cancer. No method hitherto described gives as satisfactory immediate results in cancer of the uterus, whether the case is operable or inoperable. As to cures, no judgment can as yet be expressed.

There can be no doubt that many inoperable cases can be so influenced that no evidence of carcinoma can be detected after treatment, and a number of such patients are now living one or two years after treatment who are clinically as if no cancer had ever been present. Among cases treated in the earlier period when radium was first used there are a few free for over five years. Yet it is also to be noted that especially in the cases first treated the effect was very superficial owing to the technic, and that it is recognized now that the depth of the penetration is an important factor.

If the disease has advanced to the glands, operation offers a hope of cure in some cases in which radium does not, for cases with such glandular metastases have survived operation for more than five years without recurrence, and tests of the penetration of radium indicate three and one-half centimeters as its limit. Bumm found glands with uninjured cancer cells after radium treatment. Bumm has also raised the question as to the injury or depression of vitality of cancer cells without evident microscopical injury, by reporting a case in which carcinoma nests were found up to the line of excision, yet the patient was well one and one-half years after operation with no evidence of carcinoma in or near the scar. But if radium did not give quite as many cures would it still not counterbalance the high operative mortality? Only time can tell. When we consider local effects, the limit of penetration of three and one-half centimeters gives at least as good a chance for cure as does operation.

Through recent refinements in technic, the effects of radium in the body can be controlled so that there seems to be a so-called elective or specific action on carcinoma cells, though there is objection to the use of these terms in this relation. The progress which has already been

made technically gives promise of still further improvement along the lines of lessening the dangers and increasing the efficiency. With deep penetration the danger is to the intermediate tissues.

Allman⁸ reports his experience in the treatment with radium, of inoperable carcinoma of the uterus, with results which are gratifying, when we consider the discouraging nature of this hopeless group. He comments adversely on the use of cholin, which has been so strongly recommended by some, on account of the disagreeable constitutional symptoms of which the patients complain.

Chéron and Rubens-Duval⁹ report similar favorable results in a series of one hundred fifty-eight inoperable cases, one of which was cured (histological examination). One hundred and fifty-five showed regression, some of which are clinically cured, though less than five years. There were two in which treatment failed completely. These writers prefer massive doses, as do Kroenig and some others.

The histological changes in the carcinomatous tissue are studied by Degrais and Bellot,¹⁰ whose article contains microphotographs of the progressive destruction and final disappearance of the epithelial cells in the midst of connective tissue growth.

Runge¹¹ presents the replies to an "Umfrage" or questionnaire, which was sent to a number of German gynecologists. The questions were:

(1) How do you regard radiotherapy for metropathies?

(a) X-ray.

(b) Radium or mesothorium.

(2) How do you regard radiotherapy for myomata?

(a) X-ray,

(b) Radium or mesothorium.

(3) How do you regard radiotherapy for cases of cancer of the female genitalia, and particularly in cancer of the uterus.

(a) Inoperable,

(b) Operable,

(c) Recurrence,

(d) Prophylactically after radical operation.

(4) What combination do you use in the radiotherapy of cases of uterine cancer?

(a) X-ray alone, total dose given;

(b) Radium or mesothorium alone, total dose given;

(c) Combination of x-ray and radium or mesothorium, total dose given.

(5) What filtration of rays do you consider best,

(a) for x-ray,

(b) for radium or mesothorium.

Sixteen replies to the questionnaire were received and may be briefly summarized.

For metropathies at about the time of the climacteric, x-ray gives excellent results in the

hands of all who have tried it. Radium or mesothorium seems to be no better, not indicated, or more dangerous, though few had used them for this condition.

For myomata, the results in general are very good if bleeding is the only symptom and no complications are present. But Fraenkel considers radiation more dangerous than operation, and von Herff says radiation is to be employed only if operation is contraindicated. Kroenig recommends radiation except in cases of younger women in whom enucleation is possible. In general, radium and mesothorium are not used for myomata.

Radiation gives immediate results, which are favorable in most cases of inoperable cancer. Some replies are enthusiastic, others withhold judgment, though all advocate giving it a trial.

For operable cases all operate, except Kroenig who operates only in selected cases (methods of selection not stated); Bumm, who says radiation gives certain local cure; and Pankow, who says that up to the present time, at least, radium has given good results.

Results with recurrences are generally negative or unfavorable, though all try radiation if operation is impossible. Local recurrences do much better than glandular.

Though prophylactic radiation is used by all (post operative), the general opinion is that not enough is known about results here to form a basis for judgment. In one reply it is said that the questionnaire was sent out at least a year too soon.

CURE OF CANCER BY CURETTAGE.

The question of whether cancer of the uterus is ever cured by curettage is discussed at length by Ladinski⁵ and briefly by Boldt⁶, the latter of whom merely reports a case which suggests that such a cure occurs.

Ladinski gives an interesting historical review and attributes the lack of reports of such cases from American sources to lack of care in routine examination, either neglecting curettage in doubtful cases or neglecting careful examination when curettage has been performed. The whole number of reported cases is small, so that the occurrence of three cases in the experience of one man in a comparatively short time is the more remarkable. Ladinski's paper is comprehensive, illustrated by a number of microphotographs, and takes up some aspects of carcinoma not indicated in the title. In these peculiar cases, on which the material removed on curetting shows unmistakable carcinoma, most careful microscopical examination of the whole of the removed uterus has failed to show any sign of new growth. The most natural explanation,—that there was a mistake, a mixing up of the specimens—can hardly be urged in view of the known care exercised in the clinics from which the reports are made. The true explanation seems to be that the carcinoma was small in extent and sharply circumscribed and was all

removed by the curet. Possibly the slight remnants that were left were destroyed by the natural forces of the body. But there is little, if any, scientific proof of the spontaneous cure of cancer. These cases must be regarded as of little practical significance as yet, for they are few, and as Ladinski well says, by no means to be used as giving a basis for a palliative method of treatment.

MYOMATA OF THE UTERUS AND RADIUM.

Abbe¹² reports a small series of cases of myomata of the uterus which he has treated with radium (fifty to one hundred milligrams) at varying intervals, and has observed for a number of years. The tumors have diminished in size and in some cases almost disappeared, while in others no trace of the tumor remains on palpation. In one patient the mass filled the pelvis. Abbe has not seen harmful results with the technic he has employed, and now regards radium as the treatment of choice in all cases except pedunculated fibroids. The observation of cases over a period of years has indicated the permanence of the result in menorrhagia, which is the chief symptom noted by Abbe. A simple means of intrauterine application which Abbe has devised is thin celluloid tubes, into which radium tubes can be introduced with safety even if the uterine canal is tortuous.

Kelly¹³ presents some additional cases of fibroid of the uterus treated with radium with most satisfactory results. The size and position of the tumor seem to make little difference with the result, though the larger tumors show somewhat less tendency to disappear. The preferred method of application is intrauterine. The question of dosage is not yet solved satisfactorily, but in the later cases Kelly has had a tendency to use massive doses for shorter intervals, as he thinks this is less likely to disturb ovarian function. The chief indications are a fibroid tumor, causing bleeding and without complications. The danger of overlooking malignancy is not great as this is not a frequent complication. Only one case in this series came to operation, apparently on account of the size of the tumor, the bleeding having ceased entirely. In all, thirty six cases are included in this report, covering some cases previously mentioned.

MYOMATA AND OPERATION.

Marek¹⁴ says that every myoma which gives symptoms should be removed by operation. He has had some experience in treating myomata with radium, chiefly patients in whom operation was contraindicated or by whom it was refused. His results, he says, are much like those of others who have tried radium; of sixteen cases nine were cured, four were improved and three were failures. Kroenig and Gauss alone claim one hundred per cent. of cures. So that for the present Marek still advocates operation and reports a second series of cases.

He discusses the subject from many points of view, taking up principles of treatment and indications for panhysterectomy, and gives many details of the preparation of patient for operation; narcosis, the incision and operative technic, he discusses at length. In a series of operations, in which one hundred and four were abdominal and eighteen vaginal, there were three deaths, which were attributable to the advanced stage of the disease rather than to the operation. He attributes his good results to careful narcosis, most careful asepsis, most careful attention to detail.

In his second series of one hundred twenty-five cases there was one death, following a vaginal myomectomy; death occurred on the sixteenth day from pulmonary embolus. A second case developed phlebitis of the right leg, but recovered. There were six cases of conservative transperitoneal myomectomy, three in pregnancy, in all of which convalescence was undisturbed. Even with low hemoglobin the patients do well and he operates, for vital indications, if the hemoglobin is as low as twenty per cent., and has lost none of these cases. The operation which he prefers is supravaginal amputation, which has a mortality of 1.07%, while panhysterectomy has a mortality of 4.7%. The more thoroughly malignancy is looked for, the more frequently it is found, Bumm claiming even as high as ten per cent. But especially at the time of the menopause, should one look for this complication.

Tracy¹⁵ makes a strong plea for the operative treatment of myomata of the uterus. In a large series of cases of which he collected statistics, he found thirty-three per cent. in which some condition either of the tumor or of the adjacent organs was present, which would have made x-rays useless. He estimates that twenty-five per cent. of all the cases would have died in the course of time from disease actually present, if they had been left to the x-ray. As to the claim that x-ray should not be used until the patient is about forty years of age, he found that most of the degenerations occur after forty (sixty-nine per cent.), and that ninety per cent. of the cases of malignancy occur after this age. He estimates the operative mortality at about three per cent. for he says that one death in one hundred cases usually means a death at each end of the series, which is not included.

So that in view of the complications of one sort or another, which would prove fatal to the patient is left alone, or would not be relieved without operation; in view of the time required and the uncertainty of the result with the x-ray and the prompt and certain result of operation, he thinks that x-ray should be limited to: (1) cases which cannot be operated on at all; (2) cases which may be operated on later, when built up; and (3) cases in which bleeding persists after myomectomy, in which microscopical examination of the tumor and endometrium show no malignancy.

DISPLACEMENTS OF THE UTERUS AND THEIR TREATMENT.

Hutchins¹⁶ contends that in deciding whether pelvic symptoms are or are not due to uterine displacement, the position of the fundus may be disregarded. It is the position of that part of the uterus where the support is usually applied, the cervix, which is important. Symptoms are due generally to dragging on the peritoneum and obstruction to the circulation. Hutchins has seen at operation evidences of such undue tension and obstruction in patients in whom the uterus was in anteposition but the cervix in descensus. On lifting the uterus, the circulation at once improves. It can be seen often if looked for without disturbing the relations of the organs when the peritoneal cavity is first opened. This finding indicates the line of treatment to be followed, and some appropriate and adequate form of suspension gives excellent results.

Gardner¹⁷ reports fifty-five cases of round ligament suspension of the uterus in which the Gilliam operation or some of its modifications was used. The results were determined by examination or by personal communication. In all the cases the retrodisplacement was the predominant lesion, though other conditions demanding treatment also occurred, as laceration of the cervix and perineum and adhesions of tube or ovary. Forty-one were entirely relieved; in six, anatomical but not symptomatic cure was the result. In no case in which examination was made was the uterus out of position.

The technic followed was: median incision to peritoneal cavity; exposure of sheath of rectus on each side of the median line; puncture of the rectus and underlying peritoneum about an inch from the median line and one and one-half inches from the symphysis; through this perforation the round ligament was drawn and sutured to the fascia. In some cases there was oblique puncture of the muscle to the internal inguinal ring. The puncturing instrument then passed along the round ligament and through the peritoneum at the point at which the round ligament was to be grasped. On drawing the ligament out obliquely in this way certain objections to the original technic are avoided, and it is this modification which Gardner prefers.

VESICO-UTERINE TRANSPOSITION.

Under the head of Notes on Vesico-uterine Transposition, Watkins¹⁸ again describes the technic of the operation which is widely known by his name. As thirteen of his one hundred and four cases of prolapse showed some recurrence, he has devised certain modifications of technic, but lays stress on the point that the operation should be modified to meet the requirements of the individual case. It was neglecting to observe this precaution which led to the failures.

The modifications which he suggests are amputation of the cervix, excision of part of the body of the uterus and excision of the whole uterine mucosa, according to the superabundance of uterine tissue present. With defect of uterine tissue, as a very small senile uterus, it is more difficult to deal. That the operation is not suited for all cases, or is not adequate for some cases, is at least implied in his recommendation that the operation should be performed before much protrusion through the vaginal orifice has taken place, for prolapse rapidly increases from this point on, and the larger the prolapse, the greater the dangers of recurrence following operation. Watkins appends a list of thirty-six references to the literature.

Souther¹⁹ contributes an interesting study of prolapse of the uterus, with some historical notes. He attributes to Vineberg the priority of description of the interposition operation, or vesico-uterine transposition, as Watkins himself now calls it. But the later technic has been greatly improved over Vineberg's original suggestions. The operation is becoming better known, more widely used, and receives unqualified approval from some operators. If the operation is to be performed, the possibility of ensuing pregnancy should be removed either by the menopause or by operative closure of the tubes. It should be used only in the presence of a cystocele, but may be used for any degree of prolapse up to and including complete. With certain types of retroversion with cystocele and descensus at or past the menopause it is useful. The contraindications to the use of the Watkins' operation, the preparation of the patient and an excellent description of the technic are given.

THE SUPPORT OF THE UTERUS.

Williams²⁰ maintains that the perineum and the levator ani muscle have little to do with the support of the uterus, for the uterus lies at a distinctly higher plane than do these structures. He calls attention to the well known facts that prolapse may occur without laceration of the perineum and levator ani; it may be temporary after delivery without perineal tear; and a complete perineal tear may exist without prolapse of the uterus or bladder. He holds that it is incorrectly assumed by many writers that retroversion of the uterus is the initial stage of prolapse.

The part of the uterus which is relatively fixed in normal individuals is the cervix; in prolapse the cervix has mobility equally with the corpus.

Williams concludes that the supports of the uterus and the bladder are intimately connected or identical, and that the uterus receives its support at the level of the supravaginal cervix from the pelvic fascia. There is an analogy between the floor of the pelvis and the abdominal wall, and a protrusion through either is a hernia, though prolapse of the uterus is too often not so

regarded. He emphasizes the importance of fascia in the operation for radical cure of hernia.

The pelvic fascia is a kind of sling which gives the main support to the bladder, vagina and uterus, where it is attached to the cervix. In the region of this attachment there is a fan-shaped structure, the cardinal ligament of Kocks, which is properly to be regarded as a part of the pelvic fascia, and not as the base of the broad ligament. Posterior to the broad ligaments the pelvic fascia is weaker and lies deeper in the pelvis.

Bissell's²¹ views as to the position of the vagina differ from those of Williams, for the latter holds that in general the axis of the vagina is at an angle of about forty-five degrees with the horizontal plane, while Bissell regards the vagina, except at the introitus and vault, as being almost horizontal.

Bissell describes what he considers the normal position of the uterus and vagina, which is a little lower in the pelvis than is usually thought to be correct, but he also attributes the chief support of these organs, especially the uterus, to the fascia of the pelvic diaphragm, the muscles acting only secondarily. The round and uterosacral ligaments have, it is true, a tendency to keep the uterus in "standard" position, but only when displacement is marked, backward or forward. It is more nearly correct to speak of the ventral and dorsal aspects of the uterus as inferior and superior surfaces than as anterior and posterior. In the vagina only the lowest portion can be said to have an anterior and a posterior surface, but here the ventral wall is superior and the dorsal is inferior.

Bissell has used skiagraphs to show the normal position of the uterus and vagina, introducing metal sounds. The pictures which he shows are not at all clear, and apparently there are considerable technical difficulties in the way of getting good shadows through such thicknesses of tissue, but the method would seem to be capable of much development.

Noble²² presents a consideration of the mechanical principles in displacements of the uterus, which is based on some experimental studies involving measurement of intra-abdominal pressure under varying conditions. This approximation to exactness is a welcome contribution. The apparatus used is a triple collapsible bag of rubber-silk and rubber, and a Faught blood pressure apparatus. The triple bag, collapsed, was placed in the inverted sac of a suitable postoperative or other hernia, or in the vagina. In the normal subject lying on the back the intra-abdominal pressure is nil, but rises to eighteen millimeters for the sitting or standing position. Squatting causes compression of the viscera and a pressure of twenty millimeters. Expiration in all postures failed to show any pressure whatever. But on coughing or straining the registration rose to forty or fifty millimeters. If the testing bag is placed

in the vagina beneath the cervix, it will show twenty millimeters less than the abdominal registration under similar circumstances, before the pelvic floor begins to bulge. On hard coughing the reading reaches the maximum. This he takes to mean that ordinarily the uterine ligaments take this proportion of the intra-abdominal strain; beyond that they stretch sufficiently to transmit it to the levator muscle and the contiguous fascia. In lacerations of the perineum with cystocele, the full force from the abdomen is measured in the vagina at the site of the lacerated perineum.

Noble thus measures in millimeters of mercury the intra-abdominal pressure, and his findings confirm the experience of some previous, less accurate investigators. But in the later discussion in which he elaborates the principles enunciated, he fails to take account of the fact that the contents of the peritoneal cavity are not simply water or air, or a mixture of these, but include a certain amount of solid material, the reactions of which are not explained by the laws of hydrostatics. Nevertheless the elucidation of the details of application is interesting, and should assist in clearing up a subject in regard to which there is still considerable difference of opinion.

(To be concluded.)

Reports of Societies.

BOSTON ASSOCIATION FOR THE RELIEF AND CONTROL OF TUBERCULOSIS.

THE twelfth annual meeting of the Boston Association for the Relief and Control of Tuberculosis was held in Boston on November 29. Dr. Arthur K. Stone, president of the Association, made the following address.

ABSTRACT: Throughout Massachusetts the advance this present year has been very great; new hospitals have been built and opened, and most important of all, thanks to the wise direction and insistence of the State Department of Health, dispensaries have been opened in all cities and towns of 10,000 inhabitants.

This establishment of the dispensaries in fifty-four cities and towns, and the standardization of their work, which will gradually follow through the work of the State inspectors of health, cannot but put the tuberculosis work in Massachusetts on a high plane.

In the city of Boston careful plans were formed for the care of tuberculous patients. A fine hospital has been erected at Mattapan, and during the past year 140 new beds have been added. But when this addition is in working order, there will still be a long waiting list of patients, and the trustees must continue to hire beds in other institutions, and still be unable to provide for many cases. The Dispensary of the Consumptives' Hospital Department is still doing excellent work under the direction of

Dr. Floyd and his staff, other institutions in the city referring all their cases to it; but this clinic is greatly in need of larger accommodations. It is possible also that there should be outlying sub-dispensaries.

It is a great mistake to consider the tuberculosis problem now a general health problem. We have not enough accommodations to care for those who are a danger to the community, and there is still much to be done in the way of education; and the intensive work, which can be done only by the nurse in the home, will continue to be needed for some time to come.

The Boston Consumptives' Hospital Trustees made a serious mistake when they closed the Day Camp at Mattapan. Such a camp could be well used by patients waiting to get into a sanatorium, and other patients who are in a quiescent stage, but unable to do vigorous work. The Boston School Committee, which is doing a great deal to make health conditions in schools better, might be doing much more in the way of special open air school rooms. The Children's Department of the Consumptives' Hospital should be developed, and a pre-ventorium should be carefully considered.

With over 1200 deaths a year from the disease in this city, there is much for the tuberculosis workers of this community to fight for.

The annual report of the Secretary, Seymour H. Stone, was as follows:

ABSTRACT: One hundred deaths from tuberculosis a month is what Boston suffered last year from this preventable disease. Boston needs more hospital beds to care for the many sufferers living in crowded quarters, where they are probably infecting others in the family.

A study of the records of all those examined at the Out-Patient Department of the Boston Consumptives' Hospital for the past six years show that 2% were persons who worked in establishments where food was prepared and served to the public, such as cooks, waiters, and bakers, and that one-third of these were throwing off disease germs and were consequently dangerous to the public.

As a result of this finding, the Association appointed a Committee on Health in Industry, with a paid Secretary. The aim of this committee is to preserve the health of employees, for the accomplishment of which it is seeking to install graduate nurses in mercantile and manufacturing plants. The committee believes strongly that this method not only benefits the employee, but is a saving to the employer, in that an employee in good condition is more efficient and valuable than one in poor health.

The work of the Association for the year has consisted in running Prendergast Camp, where 96 patients were aided; the carrying on of a branch tuberculosis clinic in East Boston, as an experiment in coöperation with the Maverick Dispensary and the Boston Consumptives' Hospital Department; and a special study of conditions in one section of the city where the death rate from the disease was very high.

In legislation the Association considered twenty-three different bills, approving fifteen, eleven of which became laws. The Association also supported the movement to change the organization of the Health Department by placing it under a single commissioner instead of a board of three.

One of the most important functions of the Asso-

ciation is its educational work. Exhibits were in constant use, many lectures were given, and a total of nearly 60,000 pieces of literature distributed. Another piece of educational work was the coöperation with ten other health agencies in giving free motion picture shows in the parks of the city. These shows were seen by about 125,000 persons.

Last year the Association sold 204,000 Red Cross Christmas seals, 82½% of the proceeds of which were used locally for tuberculosis work. This year's campaign has just begun, and it is hoped, with the aid of the public, that the figures of last season will be exceeded.

The importance of continuing a vigorous campaign against the disease is apparent by a recent utterance of Surgeon-General William C. Gorgas, who said: "Tuberculosis remains the most important health problem in this country in spite of all the work that has been done upon it."

Miss Ella Phillips Crandall, Executive Secretary, National Public Health Nurses' Association, New York City, made an address on,

THE TUBERCULOSIS NURSE AS A MODERN HEALTH AGENT.

ABSTRACT: The real and constant purpose of all tuberculosis work is prevention. Cure, the never-to-be-ignored-nor-neglected, is secondary and incidental. Nevertheless, this very fact has tended to swing the pendulum too far away from curative and nursing care. All thoroughly effective tuberculosis work must include both.

The relation of the nurse's service to the dispensary, clinic, class, sanitarium and hospital is that of a scouting and follow-up agent and interpreter. Her work is primarily in the home, and has its chief value because her instruction includes the home and family. This intimate contact brings to her knowledge all manner of family problems, such as employment and unemployment, housing, budgets, dietaries, pension funds, etc. It leads her into schools and to employers and landlords, to relief associations and to practically all divisions of the Health Department. She is, therefore, inevitably, a social worker and general public health nurse. If she cannot escape these duties, she must be trained for them. When trained, she will be a far greater influence for the extension of tuberculosis and all other public health work to people of all classes, and she will, thereby, help to secure public support for all such work, which should be the goal of every public health enterprise.

Miss Eunice H. Dyke, Superintendent of Nurses, Department of Public Health, Toronto, Canada, made an address on,

GENERALIZED NURSING IN TORONTO.

ABSTRACT: The nurses of the Department of Public Health in Toronto, a city of 500,000, are assigned to small districts in which they are responsible for all forms of public health nursing in the home, and also for the well-baby and tuberculosis clinics. The unit of health work is the family. This method has met the requirements of the medical specialists during the two years it has been in operation.

The task of the Department is to coördinate diverse elements in order that there may be only one health visitor in each home.

In Toronto the medical situation has been simplified by the organization of an Association of

Tuberculosis Clinics. The condition of school children at these clinics is reported to the school inspectors.

Coöperation with unorganized social agencies has been made possible. The large group of public health nurses is developing an enthusiasm and efficiency which is undoubtedly the result of responsibility and the demand for individual, constructive work.

The following officers were elected: President, Arthur K. Stone, M.D.; vice-president, Babson S. Ladd; treasurer, George S. Mumford; clerk, Miss Isabel F. Hynams. Executive committee, James N. Clark, Mrs. Ernest A. Codman, Arthur B. Emmons, 2nd., M.D., Miss Isabel F. Hynams, Babson S. Ladd, Rev. P. J. McCormack, Charles E. Mason, James J. Minot, M.D., George S. Mumford, Edward O. Otis, M.D., Robert Treat Paine, Miss Lilian V. Robinson, Arthur K. Stone, M.D.

Harvard Medical School.

HEADACHE.*

DR. DAVID L. EDSALL:

There are three conditions especially in which there is a frightful misuse of drugs as drugs, and in the treatment of which the proprietary agencies gain because of methods common in the medical profession. These conditions may be occasioned by the most elusive causes, and often require more time, pains and care from the physician than the more severe organic conditions. They are headache, insomnia, constipation. Palliative treatment alone should rarely be employed in treating headaches, as is so often the practice of physicians, for the inevitable tendency to increase the analgesic will often result in ultimate damage, sometimes serious. Cases have come under my observation of patients taking as much as 60 grains of acetphenetidine daily, by physicians' orders, as "palliative" treatment for headache. One patient took as much as 58 grains of acetanilid, and 150 grains of K. Br. in eight hours.

In considering headache as a symptom we need for practical purposes to have a point of view and method of investigating the causes of the condition. The following six causes are among the more definite and easily accessible conditions giving rise to headache:

1. Organic brain disease deserves no serious thought usually. But if the headache is comparatively recent, severe and persistent in a patient not previous subject to such pain, and especially if there is vomiting or disturbance of gait or other suggestive symptoms, organic brain disease must be considered. It may be difficult to rule it out: often it is easy.

2. Always learn whether eyes have been recently and properly refracted. If not, have them examined.

3. Headaches may arise from local lesions in the nose, sinuses or teeth.

4. *Nephritis*. This is somewhat less evident and would escape casual observation. Blood pressure, urine, eye-grounds and circulatory condition should be sufficient ground for diagnosis, but at times it is difficult to determine that nephritis is absent.

5. *Acute Infections*. These need to be thought of in recent cases. Typhoid fever in particular may be present for ten days with no other symptoms than a dull persistent headache and some malaise. Syphilis, of course, often causes headache.

6. *Toxic*. Acute alcoholism. Chronic alcoholism. Excessive tobacco, tea or coffee. Tea—apt to be drunk to excess by maids and cooks. Various industrial poisons, especially lead. Naphtha and nitro compounds. The latter, used especially in manufacture of explosives, sometimes causes both temporary and persistent headaches. The English soldiers in the Boer war indulged in nitroglycerine and dynamite drinks which were followed by severe headaches.

There are other forms of headache, the most common of all, whose etiology is less easily obtained. These are:

1. *Migraine*. The characteristic hereditary, ocular, spasmodic and hemicranial features are of value in its recognition. It is often relatively easy to benefit migraine, because it is usually increased by the other accessible causes of headache. Migraine often improves in middle life. But it is hard to treat migraine really successfully.

2. Headaches due to habits of body or to local conditions of indefinite character.

a. Fatigue. Treatment is directed at the fatigue.

b. Emotional and psychoneurotic. Be chary, however, of making a diagnosis of "neurasthenic headache." "Neurasthenic" has taken the place of "the uric acid diathesis" as a phrase to cloak ignorance.

c. Lack of exercise. The average subject of headache notices that he has less headache in the summer than during the winter. Migrainous headaches are no exceptions to this rule. The importance of exercise must not be forgotten.

d. A large proportion of patients in this class are undernourished, often not because of actual disturbance of digestion, but rather simply as the result of habit. Their diet has been small in amount and limited in type of food. Caution must be exercised in increasing the quantity and the variety. Simply spending time in the open air is of great value. In the vague types of headache the physician must expect to expend much time, care and pains in both diagnosis and treatment.

e. Local focalized infections, especially in the head, may be a source of headache.

f. Actual indigestion. The indigestion is more apt to be intestinal than gastric.

Carbohydrates are a comparatively common cause of intestinal indigestion. This is detected by gas-forming stools and excess gas formation in the intestines, and often excess in the use of these foods. Limit the carbohydrate intake to such forms as twice-baked breads.

Protein excess is sometimes the cause; here exceptionally foul stools are often found. Make thorough examination of feces in all cases.

Constipation alone undoubtedly produces headaches, but usually by means of the accompanying disturbance of the digestion (intestinal fermentation and putrefaction). Often, laxatives keep the bowels so irritated that headache follows; and if the patient is taken off the laxatives, the headache stops.

- g. Persons who have low blood pressure, and have peripheral circulation, often have headaches. The treatment here is warm baths with cold douches and thorough friction. Blood pressure may often thus be raised and the headaches removed thereby.

THE USE OF DRUGS IN THE TREATMENT OF HEADACHE.

No headache drugs are free from a permanent depressant effect in the long run. Many very sensible patients refuse drugs on this basis, but unquestionably drugs must be employed at times, though the treatment should rarely ever be purely palliative.

The following suggestions are of value in the treatment of an attack of headache:

Complete rest and quiet, with hot or cold application.

Laxative, preferably a saline, at onset.

Aspirin is of value in mild attacks.

Acetphenetidin, grs. v. repeated in two to three hours, sometimes accompanied by the bromides, controls ordinary suffering.

Antipyrin with sodium bicarbonate may be of value.

Cannabis indica, gtt. ii to v of the fluid extract is worth trying in migraine, though it frequently varies in potency, and is very uncertain in effect.

Leeches, applied to the forehead, may give remarkable results in violent headaches, especially those accompanying acute infections.

The case must be very rare which requires opiates. Discourage absolutely the use of any analgesic drugs except at times when the suffering is severe enough to demand it.

DR. GEORGE S. DERBY:

Acute diseases of the eye as a source of headache are easy to detect; the most important of them are various forms of keratitis, scleritis, iritis (especially prone to cause recurrence of headache at night) and acute glaucoma. The violent headache in glaucoma is due to acute rise in the intraocular pressure, and may be relieved by pilocarpin. The headache and vomiting seen in acute glaucoma are often so severe as to mask the ocular symptoms.

Headache assumed to be of ocular origin. The oculist sees many cases of migraine with striking eye symptoms where the pain is referred to the eyes, and the patient, therefore, assumes that the trouble is purely ocular in origin. The symptoms frequently met with are bright spots before the eyes, broadening into zig-zag lines, scintillating scotomata or "fortification phenomena." A careful refraction of the eyes should be done, because in perhaps 5-10% of the cases, marked relief of symptoms is produced by the wearing of proper glasses, and in all cases every discoverable source of irritation should be removed as far as possible.

Acute pain and headache around the eyes is not due to inflammatory conditions in the eye unless accompanied by definite signs of ocular inflammation. Diseases of the accessory sinuses are frequently responsible for pain of this character, a fact often overlooked by the general practitioner.

The eyes as a source of headache. It is extremely difficult to know how often the eyes are responsible. To determine the refractive error is easy, but we find that the degree of error sufficient to cause headache varies so enormously in different individuals

that our judgment must be based not merely on refraction findings but on the mental and physical make-up of the patient, his occupation and many other apparently extraneous factors. Here common sense is essential in making a correct estimate of the case. Almost every patient may be made equally comfortable with several differing strengths of lenses. It is a fallacy to believe there is one and only one perfect lens for each individual eye. In many instances it is possible to say that the eyes are the probable cause of headache, in many others the reverse is the case, while in a considerable number a conclusion can be reached only by trying it out, remembering that the psychological effect of glasses may often mask a really negative result.

It is astigmatism and hypermetropia that are more likely to occasion headache. Myopia and presbyopia are not so likely to be the cause, while the importance of muscular defects has in the past been overestimated. Remember that patients who give histories of very frequent changes of glasses are apt to be unstable nervously and that the ocular apparatus is very often the central point in the symptoms of neurotic individuals.

D. L. ESALL, M.D.

GEORGE S. DERBY, M.D.

ALLAN GREGG, A.B.

HARVARD MEDICAL SOCIETY. HISTORICAL SOCIETY SECTION.

HELD IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, TUESDAY EVENING, JAN. 4, 1916.

DR. M. ROSENAU IN THE CHAIR.

1. Paper on

SIR JAMES PAGET AND PAGET'S DISEASE.*

By ELLIOTT C. CUTLER, M.D.

2. Abstract of paper read on

BENJAMIN WATERHOUSE.

By A. K. STONE, M.D.

Benjamin Waterhouse was the first Professor of Theory and Practice at the Harvard Medical School and held that office for thirty years; was founder of the Botanical Garden in Cambridge and started the Museum of Mineralogy; was the first to give public talks on natural history in the United States, and introduced vaccination into America; yet there is very little reference to him in the literature. He is described by Dr. Holmes and by James Russell Lowell in their recollections of Cambridge, and Dr. Welch has written of him.

In the early days of the republic, people thought vigorously and fiercely. They were quite willing to express their opinions and to back them up, as shown by Shay's Rebellion in Massachusetts. The Federalists had complete control of the country during Washington's second administration, but this was soon broken down and the Federalist Party was largely confined to New England. In Massachusetts they commanded the political situation for a great many years.

* See Journal, page 187, Vol. CLXXIV, No. 6, Feb. 13, 1916.

Waterhouse was born in Newport in 1754. His father was a Quaker and Judge of the Court of Common Pleas; his mother, the niece of Dr. Fothergill, of England, a distinguished physician. At the age of 16, Waterhouse was apprenticed to Dr. Halburton of Newport; and at 21, he was sent to England, to the care of his uncle. Dr. Fothergill sent him to Edinburgh, where he worked in the hospital for some time. He then went to Leyden for four years, travelling about the country during the vacations. On returning to England and and Dr. Fothergill, he assisted him with his practice and listened to the learned discussions of the distinguished people with whom his uncle associated. But feeling that there was greater opportunity for useful work in the United States than in assuming his uncle's practice, he returned to America, in 1781, probably as well educated a young man as could be found here. With his induction into office at the Harvard Medical School in 1783, his troubles began. He found political activity there, with which he did not care to mix. He also felt himself much more well informed in the Hunterian doctrines than his colleagues which possibly was a cause of ill feeling. He never enjoyed the practice of medicine, but carried on a large correspondence in various directions and so kept in touch with what was going on in the world. In 1799 he received from England Jenner's book telling of the introduction of vaccination into England. This impressed him as a very important matter and he at once started to agitate the question here in the United States. He secured some vaccine from the other side and commenced experiments on his own family, finding the results identical with those reported by Jenner. He interested Dr. Boylston, who had the smallpox hospital in Brookline, to assist him by inoculating members of his family with smallpox, and then published results of their experiments. Waterhouse followed the rules laid down by Jenner and produced excellent results; but other members of the profession, not knowing these rules or not realizing their importance, were careless in their procedures; a fact which led to a great deal of trouble. One of the worst instances where Waterhouse received the blame for others' carelessness occurred in Marblehead. By 1801 the supply of true vaccine in Massachusetts had run out, but after several unsuccessful attempts he secured another importation. With this he went before the Boston Board of Health and proposed the celebrated Boston experiment on children, which was carried out. He, from this second importation, supplied Pres. Jefferson and also New York, Philadelphia and the South with vaccine.

Early in the century there was a strong feeling among the younger men that Waterhouse had outlived his usefulness in the Medical School; various attacks were made against him, and in 1812 the professorship was declared vacant and Dr. James Jackson appointed to fill the vacancy. His public lectures on natural history commanded large audiences and furnished a larger income than he received from the Medical School. In 1813 he was appointed inspector of various ports along the coast of New England, which position occupied him until 1820, after which he devoted himself to literary and scientific pursuits.

DISCUSSION.

MR. WILLIAM ROSCOE THAYER: Demonstration of the Diary and a number of letters of Benj. Waterhouse.

A snuff box sent by Jenner to Waterhouse was also shown. It contained two lancets used at that time for vaccination.

DR. CHRISTIAN: A demonstration of an original copy of the inaugural address at Harvard, delivered by Waterhouse.

Several other publications of Waterhouse are also shown.

DR. CUSHING: A demonstration of a number of original papers of Waterhouse.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, FEBRUARY 8TH, AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

EXHIBITION OF CASES.

DR. CHRISTIAN: A patient with hereditary multiple teleangiectases who shows marked secondary anemia due to repeated nose-bleed.

Paper of Drs. M. J. ROSENAU and H. C. HAVENS:

POLIOMYELITIS IN RABBITS.

The recent work in our laboratory on poliomyelitis has been divided into three parts: studies on transmission of the disease, immunity experiments, and the production of the disease in animals.

We have succeeded in transmitting the virus through eight successive transfers in rabbits. This is the first work of its kind recorded.

The animals were infected in four different ways:

1. Inoculations directly into the brain.
2. Inoculations under the sheath of the sciatic nerve.
3. Inoculations into a vein.
4. Placing the virus on the uninjured nasal mucous membrane.

Only negative results were obtained from injections into the peritoneal cavity. Of fifty-four rabbits inoculated, twenty-two came down with the disease—about 40%. This varying susceptibility of the rabbits may explain the varying results obtained by other workers.

The incubation period in rabbits varies from two to forty-one days. This is entirely independent of the method of inoculation.

The symptoms may be roughly grouped into two sets.

1. *The progressive type.* The animal becomes sick, loses weight, the appetite decreases and ultimately a paralysis appears in one or more extremities. Then within a few additional days there is a general paralysis.

2. *The fulminating type.* The whole syndrome occurs within a few hours. One rabbit remained well for twenty-five days (the incubation period) and then suddenly within one hour it entered into a state of collapse. It died during the next few hours. Other animals succumbed less rapidly.

Concerning the age limits, it was found that full-grown rabbits resisted the infection, whereas young animals reacted to it. All of the successful takes were under eight weeks of age. If this continues to hold true in future experiments it will furnish a striking parallelism with the human cases.

The virus in rabbits does not become fixed as in rabies. It is filterable as in monkeys and in man.

The lesions in rabbits differ from those in monkeys. They form a picture of a severe intoxication having an affinity for the gray matter. The brunt of the attack is expended on the gray matter of the central nervous system, especially of the spinal cord and medulla. While no perivascular infiltration is noted, such as occurs in man, there are present hyperemia, general edema, capillary congestion and focal hemorrhages. The motor cells show marked degeneration and a diffuse infiltration of endothelial-like cells is found.

It seems logical to believe that we are dealing with real poliomyelitis, for we have an acute paralytic disease with a filterable virus which is capable of being transferred from generation to generation and of being inoculated through various channels. The pathology, furthermore, concerns the gray matter of the central nervous system. Hence we are dealing with one disease; the rabbit, however, reacts quite differently than does either the monkey or man.

Paper of Drs. H. C. HAVENS and M. J. ROSENBAUM.

IMMUNITY TO POLIOMYELITIS.

Three kind of viruses were used in our experiments in immunity: emulsions heated to 45° to 50° C, emulsions to which amounts of chloroform had been added (cold) and a virulent virus, secured from strains which had lost their virulence naturally and suddenly.

Monkeys were injected with these several types of virus intracranially, intravenously and subcutaneously. No success attended the intracranial inoculations. Relatively large numbers of injections are necessary to produce immunity with the subcutaneous and intravenous routes. Subcutaneous injections continued over a long period will produce an immunity as absolute as that which follows a natural attack.

Paper of Drs. R. W. LOVETT and E. G. MARTIN:

RECENT DEVELOPMENTS IN THE STUDY OF INFANTILE PARALYSIS.

The conclusions presented here are based upon certain clinical observations made with new methods. These have resulted from the work on some 200 cases of paralysis which occurred in the Vermont epidemic of 1914.

Charts of the individual muscles affected were made in all of the cases studied. About 2½ cases showed a partial, and one a total paralysis of each muscle. We had always supposed hitherto that a total paralysis of each affected muscle was the rule. These results show the reverse. Accordingly, it is desirable to study the means of bringing back the muscles to as near the normal as possible. The weakened muscles are not less susceptible to exercise than normal muscles.

Our difficulty at the outset of the work was in not having a quantitative guide to determine the extent of the partial paralyses. Dr. Martin developed a method which has proven to be very satisfactory. Ten muscles in the leg and twelve in the arm are tested by means of a spring balance. The scale must be held at right angles to the limb to be tested. The limb is always placed in a standard position.

The test is very accurate. In normal children the results from testing corresponding muscles are sur-

prisingly uniform. From a series of tests carried out in normal children a table of weights has been constructed.

A definite local weakness in a child which has suffered from an indefinite illness is thus suggestive of an attack of poliomyelitis. Since one muscle is rarely affected alone in a child, it appears infantile paralysis is a pretty wide-spread disease of the muscles. About 80% of the muscles involved lie below the knee.

The affected muscles remain the same or they improve. They do not grow weaker. Exercise should not be permitted until muscle soreness has entirely disappeared.

ERNEST G. GRAY, M.D.

Book Reviews.

A Mechanistic View of War and Peace. By GEORGE W. CRILE, edited by AMY F. ROWLAND. New York: The Macmillan Company. 1915.

This unusual monograph represents the results of the author's clinical observation of the behavior of man in injury and disease and the extension of his now familiar doctrines of anoci-association to the mechanistic explanation of various phenomena of human activity as observed in war and under the influence of different emotions. His work touches also the contribution of Loeb to the mechanistic interpretation of the animate universe and that of Cannon on the physiology of the emotions. It is obvious that while the study and experiment, upon which Dr. Crile's theory is based, extend back over many years, his experience in the present European War has been the immediate stimulus to the production of the present volume. The substance of his pages was written in the war zone and was delivered by the author at a lecture at the Western Reserve University. It is to be regarded, according to the preface, as an introduction to a forthcoming volume on man as an adaptive mechanism.

Dr. Crile divides the present monograph, after a brief introduction, into five chapters dealing respectively with the phenomena of war, the biologic interpretation of war, the mechanistic view of culture, the mechanistic view of the Belgian invasion and the possibility of evolution toward peace. He does not believe that war can be eliminated from the web of life or feel certain that its complete elimination would be an advantage to man. His purpose is purely analytical and as such, in spite of the unusual character of his subject, seems genuinely scientific. The book is interestingly illustrated with a series of 32 full-page plates representing phenomena of conflict, both macroscopic and microscopic. Whatever its ultimate acceptance, it is a genuine con-

tribution to medical philosophy, and as such deserves the attention of the profession.

A Synopsis of Medical Treatment. By GEORGE CHEEVER SHATTUCK, M.D. Second revised printing of the second edition. Boston: W. M. Leonard. 1915.

Some years ago Dr. Shattuck published a little pamphlet on Medical Treatment for use in his teaching in the fourth year of the Harvard Medical School. The present small book is the slow and normal outgrowth of that pamphlet. Condensed into the book's few pages are all the fundamental facts of modern medical treatment. There is no discussion and all therapeutic measures of doubtful value are happily eliminated.

It is a pleasant relief to find a book on treatment which is willing to confess that only general measures are indicated in certain diseases. One of the most valuable parts of the book is the short chapter on drugs. Dr. Shattuck is able to cut the number of his important drugs down to thirty and he discusses those adequately. It is a valuable little book for anyone who wishes the plain statements of the fundamentals of medical therapeutics.

Diseases of Nutrition and Infant Feeding. By JOHN LOVETT MORSE, M.D., and FRITZ B. TALBOR, M.D. New York: The Macmillan Company. 1915.

The authors state in the preface to the book that it was written in order to give "a detailed description of the scientific basis of rational infant feeding and a description of the method of infant feeding taught in the Harvard Medical School." The purposes for which the book was written have been fulfilled.

Section one contains a careful review and analysis of the literature of digestion with especial application to infant feeding. It is divided according to the various food elements,—fat, carbohydrate, proteid and salts, thus rendering it particularly valuable for reference. There is also included the literature of the recent work on infant metabolism. A description of the stools in infancy and the methods of analysis gives an adequate foundation for this important feature of infant feeding. It has often been stated in criticism of books of pediatrics that so much attention has been given to artificial feeding that breast feeding has been crowded into the background. The criticism does not apply to this book. One sixth of the entire contents is devoted to breast feeding, a statement of our present knowledge concerning breast milk and a careful consideration of the management of the mother and of the child. Artificial feeding is introduced by a description of cow's milk and its production. There is a detailed statement of the principles of artificial feeding of infants and

the practice as taught at the Harvard Medical School. The section on the diseases of the gastro-intestinal tract is based upon the classification of these diseases adopted some years ago by the Harvard Medical School.

Not all pediatricians will agree with the details of infant feeding given in the book nor with some of the conclusions in regard to the diseases of the gastro-intestinal tract, but all will agree that the book is a very clear and practical statement of the authors' position in regard to these subjects. The literature of infant feeding is presented in a more complete form than at any time previously. The book should prove of distinct value to those interested in either the experimental or the practical problems of infancy. It is altogether the best book on infant feeding thus far written.

Infant Health. By J. (SHAWN) CAMERON MACMILLAN, C.M.B., A.R.S.I. London: Henry Froude and Hodder and Stoughton. 1915.

This volume in the series of Oxford Medical Manuals is intended as a handbook for district visitors, nurses and mothers. It is based on a series of lectures to voluntary health visitors in Aberdeen and Oxford. The book is warmly praised in a brief foreword by Sir William Osler, whose recommendation should be sufficient evidence of the value of the work. The book is divided into six chapters, dealing first with anatomy, second with pregnancy and birth, third and fourth with infant feeding, fifth with the hygiene of infancy, and sixth with the relation of the health visitor to the infant and to the family. Two appendices contain a circular on maternity and child welfare issued by the London local government board to county councils and sanitary authorities, and several memoranda and schedules on the same subject. The practice and methods outlined in the book are not in all instances in accordance with our American teaching but may be regarded as representative of British custom. The book is illustrated with several anatomic cuts.

The Medical Clinics of Chicago. Vol. I, No. 3 (November, 1913). Philadelphia and London: W. B. Saunders Company. 1915.

The third number of the Medical Clinics of Chicago contains two hundred pages and the discussion of twenty diseased conditions by eight internists of Chicago. This number follows the general plan of the earlier numbers, and of Murphy's Surgical Clinics. As a rule, a case is presented informally and used as a convenient peg on which to hang a varying amount of discussion of the condition represented. The cases presented are all interesting; the presentation is informal, not at all didactic, and makes no pretense toward thoroughness.

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CLASSIC RITUAL AND THE ASEPTIC TECHNIC.

HAD one the whole Past to draw upon, the choice of erudulous laymen or of physicians wise in the learning of their time, the pick of an audience from By-Gone Days to fill the surgical amphitheatre on invitation—whom would one choose? What class among forgotten men could best divine, without a word of explanation, the broader meaning of the sights of an operating room? Who of all men back to prehistoric times could, as they watched, best comprehend the various procedures of an operation, needing no special words of explanation, finding no step incongruous or crude, but seeing all and thinking it appropriate and proper?

Certainly not our predecessors in the Art!

They would feel sadly ill at ease in such a gathering. All the accessories of the operation would confuse them—gloves, gown and masks, cone, sterile water, and the jangling horde of hemostats would cause them sore distress. They would cry humbug to half of it, and halt to the rest.

No, the only truly understanding audience would consist of blue-skinned, naked Druid priests (not bothered by the operating room's temperature, *O fortunati!*), of stern Latin fathers, of close-shaven Egyptian priests, or the long bearded Levites of the Mosaic Law. These gentlemen, and these alone, could view with reverence, appreciate with childlike faith and unwitting accuracy, the real meaning of a modern surgical operation. They would, of course, err pardonably in considering with religious awe the close-tied white vestments of the operator and his assistants. We could forgive them if they murmured respectful approval of his sacred ten-minute scrub, his gown taken from the holy sterile nickel cauldron, and his sedulous care in avoiding all loathsome uncleanness. He would compel their admiration as he stands, hands pointed in the air invoking some God of Purity to attend this rite. In the anesthetist, the Roman would recognize the priestess of Lethe, leading the soul to the border of the Styx, that he may there leave behind the Evil Spirit we know as "discomfort" and "loss of function." Would not the Druid understand the magical value of dipping the hands three times in the blue bichloride, or the glorious wine-stained permanganate? What joy and satisfaction on the benches when the mystic cautery was handed about in stern aseptic solemnity! And if a culture were taken, these men would shudder in admiration to see the devil that possessed the sufferer so bottled up, and so triumphantly borne away to tell the secrets of his strength to his determined captor. Nor would it take long argument to persuade such audience of the oracular power of the sacred guinea-pig. They'd nod. They'd understand.

Would it seem strange to any Latin priest, seated in proud attention on the benches, to recognize as *haruspex* and soothsayer the white-coated pathologist, who, given a bit from the entrails to examine, as of old, is believed when he divines therefrom the Future? Surely the New has strange resemblance to the Forgotten Past,—and Technic is but ritual, with Truth behind it.

A. G.

INDUSTRIAL HEALTH INSURANCE.

IN the issue of the JOURNAL for January 6 (Vol. clxiv, p. 32) we published a brief editorial announcing the prospective introduction before the Massachusetts General Court, under the auspices of the American Association for Labor Legislation, of a bill providing for a system of health insurance for all industrial workers receiving salaries of \$100 a month or less. This bill has since been introduced by the Honorable Walter M. Chandler, of Cambridge. Its text is at present still not available; but there has been introduced before the New York General Assembly recently a bill substantially the same as that introduced in Massachusetts. The Committee on Social Insurance of the American Association for Labor Legislation has also published a pamphlet containing explanatory matter, embodying its health insurance standards, with the tentative draft of an act which has been somewhat altered and expanded in the bills as presented to the New York and Massachusetts Legislatures. The standards of health insurance, as outlined in this pamphlet, are as follows:

"1. To be effective, health insurance should be compulsory, on the basis of joint contributions of employer, employee and the State.

"2. The compulsory insurance should include all wage workers earning less than a given annual sum, where employed with sufficient regularity to make it practicable to compute and collect assessments. Casual and home workers should, as far as practicable, be included within the plan and scope of a compulsory system.

"3. There should be a voluntary supplementary system for groups of persons (wage workers or others) who for practical reasons are kept out of the compulsory system.

"4. Health insurance should provide for a specified period only, provisionally set at twenty-six weeks (one-half year), but a system of invalidity insurance should be combined with health insurance so that all disability due to disease will be taken care of in one law, although the funds should be separate.

"5. Health insurance on the compulsory plan should be carried by mutual local funds jointly managed by employers and employees under public supervision. In large cities such locals may be organized by trades with a federated bureau for the medical relief. Establishment funds and existing mutual sick funds may be permitted to carry the insurance where their existence does not injure the local funds, but

they must be under strict government supervision.

"6. Invalidity insurance should be carried by funds covering a larger geographical area comprising the districts of a number of local health insurance funds. The administration of the invalidity fund should be intimately associated with that of the local health funds and on a representative basis.

"7. Both health and invalidity insurance should include medical service, supplies, necessary nursing and hospital care. Such provision should be thoroughly adequate, but its organization may be left to the local societies under strict governmental control.

"8. Cash benefits should be provided by both invalidity and health insurance for the insured or his dependents during such disability.

"9. It is highly desirable that prevention be emphasized so that the introduction of a compulsory health and invalidity insurance system shall lead to a campaign of health conservation similar to the safety movement resulting from workmen's compensation."

The tentative bill lacks specific details in the chapter relating to the provision for medical benefit. This omission has arisen from the policy of the Social Insurance Committee to postpone drafting these administrative regulations closely affecting the medical profession, until it can benefit from the advice and coöperation of the profession itself. The committee has also refrained from attempting to decide what should be the basis of remuneration or the rate of compensation. The American Medical Association has already offered its coöperation with the American Association for Labor Legislation in the study of the subject of health insurance, and for this purpose has appointed a special committee, consisting of Dr. Alexander Lambert of New York, Dr. Frederick J. Cotton of Boston, and Dr. Henry B. Favill of Chicago. Various local medical bodies have also appointed committees to study the subject, to make recommendations, and to confer with the social insurance committee. Without further commenting as yet on the provisions of the bills already submitted in New York and Massachusetts, the JOURNAL desires editorially to call attention to them, and to the standards of health insurance advocated by the Association for Labor Legislation; and to urge physicians throughout the Commonwealth to give this important subject their attention, study and coöperative interest.

NATIONAL COMMITTEE FOR MENTAL HYGIENE.

THE eighth annual meeting of the National Committee for Mental Hygiene, held in New York City on February 2, was attended by a number of distinguished alienists, publicists and social workers. It was announced by the treasurer that the sum of \$22,800 has been donated by the Rockefeller Foundation to the National Committee for carrying on surveys of the care of the insane in sixteen states during the present year. This sum, supplementing previous gifts from private sources, will make it possible for the committee greatly to extend its work.

The report of Mr. Clifford W. Beers, the secretary, showed that the movement for conserving the mental health and for improving the care of the insane and feeble-minded has grown in a remarkable way. Societies for mental hygiene are now at work in Connecticut, Illinois, New York, Massachusetts, Maryland, Pennsylvania, North Carolina, the District of Columbia, Alabama, Louisiana, and California. During the present year societies will be organized in Michigan, Rhode Island, Minnesota, Indiana, South Carolina, Tennessee and Texas. The financial resources of the National Committee and state agencies have also increased, until now about twenty-five times as much is being expended on this sort of mental hygiene work as was spent in 1908, when the first society was founded.

Dr. Walter E. Fernald, Superintendent of the State School for the Feeble-minded, of Waverley, Mass., presented a plan which had been adopted by the Sub-committee on Mental Deficiency, of which he is chairman, for popular education, extensive surveys and researches in this subject. Demands for advice regarding institutional provisions, special classes for backward children, and psychological examinations in the children's courts, Dr. Fernald said, had been received from all parts of the country, and it was felt that this movement to deal more adequately with the problem of the feeble-minded could be greatly helped by the same kind of authoritative advice and aid which is being given on behalf of the insane. A strong appeal was made by Dr. Fernald for special funds to meet the increased demands for this kind of work. Dr. William L. Russell, Medical Superintendent of Bloomingdale Hospital, described how the work of the National Committee is con-

ducted under the supervision of an Executive Committee, all experts in different fields of mental hygiene.

Dr. Thomas W. Salmon, the medical director of the committee, gave an account of the surveys of the care of the insane which had been carried on during the year in South Carolina and in Texas, and announced that similar studies, each conducted by expert alienists, are under way or about to be undertaken in California, Tennessee, Missouri, Illinois, North Dakota, Indiana, and in the District of Columbia. Requests for some of these surveys have come from the highest officials in the states, and attention was called to the striking change of attitude on the part of those charged with the care of the insane, who not only permitted, but welcomed, such expert studies of their facilities for dealing with mental diseases. In the course of a moving description of the sufferings of the insane confined in county almshouses, jails and poor farms, Dr. Salmon expressed the belief that the surveys which have been made possible by the appropriation of the Rockefeller Foundation will result in the complete abandonment of this type of neglect within the next few years. The steady decline in the number of persons in almshouses, which has existed since 1880, is due, he said, in large part to the increasing provision in hospitals for the insane, and with the acceleration of this movement, and increased provision for the feeble-minded, the end of the small town or county poor farms which dot the countryside, is in sight. It was shown that 1668 such institutions, each with less than twenty-five inmates, existed in the United States, all serving no useful purpose but, on the contrary, inviting the improper detention of the insane and the feeble-minded. The most encouraging feature of Dr. Salmon's report was an account of the increasing interest in securing psychopathic hospitals for all large cities, in which the earliest and most efficient treatment can be provided for acute and recoverable cases of mental disease. Such hospitals, each with its out-patient departments and psychological clinics for children, exist in Boston, Baltimore, and Chicago, as well as in several smaller cities, while New York is still unprovided with such an institution.

At the close of its first eight years of activity, the work of the National Committee for Mental Hygiene has become well established, and fills a definite function in the preventive medicine of

the day. Though its work may be concerned less with the prevention than with the control of insanity, yet its influence, by leading to the betterment in the conditions of care of the insane and feeble-minded, and the education of the community relative to mental disease, cannot fail to have a reflex, if not a direct, influence on the public attitude toward insanity, on the welfare of the insane, and on the prevalence of mental diseases of certain types.

AN IMPORTANT LEGAL DECISION.

ON February 7 an important legal decision, affecting the medical profession, was rendered by the full bench of the Massachusetts Supreme Court in the settlement of a controversy arising under the Workmen's Compensation Act. The Industrial Accident Board had decreed an award of \$225 and fourteen days of medical and hospital treatment to a beneficiary who was employed in a carpet factory and who, while pulling a piece of carpet in the course of her employment, suffered an attack of angina pectoris, which was held by the board to be a personal injury within the meaning of the act. This award was disputed by the liability company with which she was insured, but was affirmed, sustained and upheld in full by the Supreme Court. In rendering this decision, Chief Justice Rugg stated his opinion and his interpretation of the act in part as follows:

"It is enough to say that the occurrence described by the defendant when she said she felt 'something give' and 'felt something else give way,' accompanied by the symptoms of angina pectoris, may have been found to be a 'personal injury.'

"It has been argued on behalf of the insurer that since the harm to the employee was not wholly the effect of the work, but came in large part from the previous weakened condition of the employee's heart, hence, either there can be no award of compensation, or it should be restricted to that part of the injury which resulted directly from the work, and the part of the injury which followed from the previous condition should be excluded.

"Even though the premise be sound, the conclusion does not follow. The act makes no provision for any such analysis or apportionment. It protects the 'employee.' That word is used in Part 5, Section 2, as including 'any person in the service of another under any contract of hire,' with exceptions not here pertinent.

"There is nothing said about the protection being confined to the healthy employee. The previous condition of health is of no consequence in determining the amount of relief to be afforded. It has no more to do with it than his lack of ordinary care or to the employee's freedom from simple negligence.

"It is a most material circumstance to be considered and weighed, in ascertaining whether the injury resulted from the work or from disease. It is the injury arising out of the employment, and not out of the disease of the employee, for which compensation is to be made. Yet it is the hazard of the employment acting upon the particular employee in his particular condition of health, and not what the hazard would be if acting upon a healthy employee or upon the average employee.

"The act makes no distinction between wise or foolish, skilled or inexperienced, healthy or diseased employees. All who are rightly describable as employees come within the provisions of the act.

"It is argued that grave economic consequences of far reaching effect may follow from the act as thus construed. It is said that persons not in good health may be altogether excluded from employment to their severe hardship, while the cost of conducting commercial and industrial enterprises may become prohibitively large, all to the detriment of the general welfare and of the financial resources of the Commonwealth.

"These considerations are of great public moment. But these factors relate to legislative questions, and the arguments founded on them are distinctly legislative arguments. They may be entitled to attention and deliberation at the hands of the legislative department of government. In the present form they cannot have decisive significance, even if it were plain that the enumerated consequences were inevitable. The function of the judicial department of the government is simply to determine whether an act is within the power vested by the constitution in the legislature, and then to enforce it according to its true meaning in cases as they arise."

According to this decision, the act is held to provide, not merely for employees who have received some accidental injury or incurred some new sickness as a result of the conditions of their employment, but also for those becoming incapacitated by reason of the fact that some preëxistent illness or physical weakness has been aggravated by an incident of their employment. The court points out the grave economic consequences that may result from its construction of the act, but holds that its duty is purely interpretative.

As a matter of fact, from the physician's point of view, it is difficult to foretell exactly

how such a decision may operate. On the one hand, it may lead to the exclusion of physical defectives from employment at which they might otherwise earn a living, thereby subjecting them to personal suffering and hardship, or making them eventually charges of the state. On the other hand, such exclusion might work to the benefit of industrial efficiency and to the welfare of the community, by elimination of some of its unfit. Sociologic legislation of the type of the Workmen's Compensation Act is so inextricably associated with questions of public health and of preventive medicine that its effect may react unexpectedly on medical as well as on social problems.

SUPERHEATED RAILROAD TRAINS.

IN previous issues of the JOURNAL, we have commented from time to time on the evils of the prevalent unhygienic practice in America of superheating houses, public buildings and public conveyances during the winter season. Recognition of these evils by the laity is slow, yet an order recently issued by the general superintendent of the Union Pacific Railroad System is evidence that the truth of this proposition is gradually making headway. The text of this order is as follows:

"All sleepers, chair cars and coaches operated over Union Pacific Lines are equipped with ventilating systems by which an adequate supply of fresh air is provided.

"Cars must be well ventilated at all times and not allowed to become too warm, or overheated.

"High temperature is more detrimental to health than lack of fresh air.

"The following temperatures must be maintained during the cool season:

"Sleepers: Days, 70°; nights, 60°.

"Chair cars and coaches: Days and nights, 70°."

As a matter of fact, the superheated, and often inadequately ventilated, Pullman car is one of the great discomforts of extended continental travel. It is to be hoped that this order may be indicative of a developing realization by public transportation companies of the disadvantages of superheating their conveyances, and of an intention to consider in this regard the health interests and real comfort of their patrons.

MEDICAL NOTES.

NEW YORK DEATH RATE.—According to figures compiled by the Department of Health, the deaths from influenza and pneumonia during the past week were slightly lower than the previous week. During the week just closed there were 346 deaths from influenza and pneumonia, as compared with 360 during the week ending February 5, and 424 during the week ending January 29. The deaths from heart disease and nephritis show a slight increase over the deaths from the same causes during the previous week, but a very considerable decrease as compared with the deaths from these causes during the week ending January 29. The deaths from the infectious diseases during the week were 51, exactly the same number reported from these causes during the corresponding week of last year, and a very slight increase over the number reported from these causes during the two previous weeks of this year. During the week ending February 12, 1626 deaths were reported, with a rate of 15.18, as compared with 1546 and a rate of 14.79 during the corresponding week of last year; the difference of .39 point in the rate is equivalent to an increase of 42 deaths. During the first seven weeks of 1916 the death rate was 16.28, as compared with 14.78 for the corresponding week of last year.

IMPORTANT NEW PROCEDURE IN DIPHTHERIA.—Certain studies recently made by the New York Department of Health have shown that, in a number of instances, patients convalescent from diphtheria, who have been released from quarantine under the present procedure of two consecutive negative cultures, have shown as a result of still later cultures, the persistence in their throats of diphtheria bacilli. In order more perfectly to assure the absence of bacilli and to diminish the number of patients in whose throats they may persist, a definite period of quarantine has been established, as follows:

"On and after February 28, 1916, no later culture will be examined for release from quarantine which is made earlier than twelve days from the date of report of the disease. Two consecutive negative cultures, made twenty-four hours apart, preferably from both nose and throat, will be required, as at present."

TRUDEAU MEMORIAL FOUNDATION.—In the issue of the JOURNAL for January 27 we commented editorially on the establishment of the Trudeau School of Tuberculosis at Saranac, in memory of the late Dr. Edward Livingstone Trudeau. At a meeting of the trustees of the Adirondack Sanatorium, recently held in New York City, plans were made for raising the sum of \$5000 for the purpose of endowing the Trudeau Memorial Foundation, to provide in the future funds for conducting research in tuberculosis and for developing methods for its treat-

ment. The name of the Adirondack Cottage Sanatorium is to be changed to the Trudeau Sanatorium.

UNIVERSITY OF PENNSYLVANIA.—On Friday, February 4, the 150th anniversary of the foundation of a medical school by John Morgan at the University of Pennsylvania was celebrated by a dinner given in that city by the Society of the Alumni. The occasion was of especial interest, since the establishment of this school virtually marked the beginning of medical teaching in the United States.

VITAL STATISTICS, STATE OF MICHIGAN.—The forty-seventh annual report of the State of Michigan, which covers the year 1913, gives a birth rate of 24.8, a death rate of 13.8, a marriage rate of 22.7, and a divorce rate of 2.7. There were 3521 more births during this year than in the year 1912. Of the total number of children born,—73,058,—there were born to parents both native born, 42,017; and to parents both foreign born, 18,546. Of the total number of deaths,—40,827,—2,729 were caused by epidemic diseases, 2703 by tuberculosis, 2388 by cancer, 4374 by heart disease, and 2143 by diarrhea and enteritis. The total number of marriages was 33,529. The ages at which the largest percentage of both males and females were married were from 20 to 24. In 2061 cases, of the total number of 3978 divorces granted in the state, there were no children in the families broken up by the divorce.

VITAL STATISTICS OF DUNDEE.—In a recent issue of the *British Medical Journal* attention is called to the low birth rate and high death rate prevalent during the year 1915, in Dundee, Scotland. For the year 1915 the birth rate in Dundee was just over 22 per 1000 inhabitants, compared with 28 per 1000 in 1905, 24.5 in 1913, and 25 in 1914. Previously the falling birth-rate was offset by a falling death rate. In 1915 this was not so, the surplus of births over deaths being only 165; in the worst of the previous years it was never below 1500. Among children under one year of age, the proportion of deaths was 210 for every 1000 born. A contributory cause of this high mortality was the occurrence of two severe epidemics of whooping cough, while measles prevailed in the city in the early part of the year. Whooping cough also accounted for 336 deaths, causing the heaviest death rate from whooping cough known in Dundee.

THE MALARIA PROBLEM OF THE UNITED STATES.—In the recently published annual report of the Surgeon-General of the United States Public Health Service is a consideration of the prevalence of malaria in this country, based on the report of 204,881 cases during 1914. It is stated that in certain sections of the

South, 40% of the inhabitants are infected with this disease. Of 13,526 blood specimens examined by government officers during the year, 1797 showed malarial infection. The infection rate among white persons was above eight per cent., and among colored persons twenty per cent. In two counties in the Yazoo Valley, 40 out of every 100 inhabitants presented evidence of the disease.

Striking as the above figures are, they are no more remarkable than those relating to the reduction in the incidence of the disease following surveys of the Public Health Service at 34 places, in nearly every state of the South. In some instances, from an incidence of 15%, in 1914, a reduction has been accomplished to less than 4 or 5%, in 1915.

One of the important scientific discoveries made during the year was in regard to the continuance of the disease from season to season. Over 2000 Anopheline mosquitoes in malarious districts were dissected, during the early spring months, without finding a single infected insect. and not until May 15, 1915, was the first parasite in the body of a mosquito discovered. The Public Health Service, therefore, concludes that mosquitoes in the latitude of the Southern states ordinarily do not carry the infection through the winter. This discovery indicates that protection from malaria may be secured by treating human carriers with quinine previous to the middle of May, thus preventing any infection from chronic sufferers reaching mosquitoes and being transmitted by them to other persons.

Although quinine remains the best means of treating malaria, and is also of marked benefit in preventing infection, the eradication of the disease as a whole rests upon the destruction of the breeding places of Anopheline mosquitoes. The Public Health Service, therefore, is urging a definite campaign of draining standing water, the filling of low places, and the regrading and training of streams where malarial mosquitoes breed. The oiling of breeding places, and the stocking of streams with top-feeding minnows, are further recommended. The Service also gives advice regarding screening, and other preventive measures as a part of the educational campaigns conducted in sections of infected territory.

This study is typical of the scientific investigations which are being carried out by the Public Health Service, all of which have a direct bearing on eradicating the disease. The malaria work now includes the collection of morbidity data, malaria surveys, demonstration work, scientific field and laboratory studies, educational campaigns, and special studies of impounded water and drainage projects.

COMPARISON OF PUBLIC HEALTH WORK.—The Russell Sage Foundation has recently made an investigation of the activities and efficiency of municipal health departments in this country. through Dr. Franz Schneider, Jr. For com-

parison, a group of 127 cities was taken, having a population of over 25,000 each.

About 10% of these could give no statement of work on infant mortality, which is one of the indices of effective health endeavor. The total expenditure of all these cities is about ten million dollars, or 33 cents per capita, while, with New York City excluded, the figure drops to 27 cents a head. It is perfectly true that the different health department appropriations mount far above these figures, but much of the work is of the wrongly-termed 'sanitary' kind, like collecting ashes, removing garbage, plumbing inspection, and the like. Actual preventive work in this country, therefore, is attempted at the rate of a quarter of a dollar a head, and at the same time sanitary engineers realize that to be efficient three to four times that amount would be required.

"Seattle leads the list in point of proportionate amount directly used, about 98 cents, with Memphis second at 93 cents. Pittsburgh spends 61 cents; Augusta, Ga., 61; and New York City, 58. At the other end of the scale are Easton, Pa., with 2 cents per capita; Aurora, Ill., and South Bend, Ind., 3 cents; Woonsocket, R. I., 4 cents; and Lewiston, Me., 6 cents. When it comes to the consideration of efforts to lessen the infant mortality, there is no one of the large cities that is not at work on the problem, but as the cities diminish in size there is less and less attention paid to the matter. About one-third of the cities below 50,000 and one-quarter of those between 50,000 and 100,000 are in the 'no effort' group and in their company there are three cities between 100,000 and 300,000. In this progressive work New England leads, with the South Central States and the Pacific States a good and fairly close second. In this the states that have the smallest per capita appropriations, those north of the Ohio and on both sides of the Mississippi, are least forward.

"One-fifth of the important cities (above 25,000 population) make no inspection of school children; one-third offer no laboratory diagnosis for the commoner communicable diseases; one-quarter do not try to enter into the important field of educating the people in health matters; three-quarters have no housing laws; nineteen-twentieths have no concern with the hygiene of industry; one-half have no consistent plans against infant mortality, and three-quarters have no coherent program against tuberculosis. In every one of these items there has been established a reasonably definite line of progress and action, in which the leading authorities of the country agree substantially.

EUROPEAN WAR NOTES.

AMERICAN AMBULANCE HOSPITAL.—The following letter, recently received, records the continuing work of the American Ambulance Hospital at Neuilly, France, and its need for further funds to maintain its beneficent activity:

"The ambulance committee has received from the committee at New York a list of the donors to the maintenance fund of this hospital and its various special departments, and it appears that of all the faithful, devoted and efficient friends of the American Ambulance your committee is especially conspicuous for the number and liberality of the contributions sent forward. At the close of this memorable and tragic year, during which the Ambulance Hospital and its field ambulance corps have rendered services to humanity which will always be gratefully remembered by the Government and people of France, this committee desires to place upon record its sincere and grateful appreciation of your work for the cause in which we are all interested and, through you, to thank gratefully all who have aided you with their labor or contributions since the beginning of the war.

"The Ambulance is still in the zenith of its efficiency and usefulness, and its standard of efficient service will never be lowered so long as it is supported and encouraged by the generous maintenance of friends like those of New England and the United States. The 'Boston Ward' is one of the principal features of the hospital and reflects a shining credit upon the city whose name it bears.

"For the Ambulance Committee,

(Signed) "Frank H. Mason, Chairman."

In addition to the four women who have always formed the New England Committee of the American Ambulance Hospital, Paris, the following-named have become members of that branch of the American Committee: Augustus Hemenway, James J. Storrow, Eliot Wadsworth, Dr. Harvey Cushing and Dr. Robert B. Greenough, all of Boston.

PILLS FOR TYPHOID PREVENTION.—It is reported that Lumière, a French physician, has succeeded in making a pill containing dead typhoid bacteria, which may be swallowed by the patient, as a method of inoculation in preference to the vaccination method. The pill is covered with a casing which resists the action of the stomach, and is not dissolved until it reaches the intestines.

METHOD OF LOCATING BULLETS.—Desplats and Paucot recently brought to notice, at a meeting of the French Academy of Sciences, a graphic x-ray method of locating bullets within the human body, a process of similar triangles. The shadow of the bullet is marked on the screen and an opaque bit of plaster placed on the skin where the ray emerges. The lamp is then moved four or five inches, and this time the screen will show the displaced shadow of the bullet with reference to that of the plaster. The three points on the screen give, by means of a scale, the depth of the bullet within the body.

DEARTH OF BRITISH MILITARY SURGEONS.—In a recent issue of the *London Chronicle* it is reported that a call has been issued for 5000 more physicians under the age of 45, to serve at the front in the British Royal Army Medical Corps. Of the approximately 30,000 physicians in Great Britain, 10,000 have already volunteered, and if this new call is met, only 15,000 physicians will remain to care for a civil population of 40,000,000. Besides their ordinary duties, these physicians are obliged to undertake a great deal of additional insurance work, as well as to care for the sick and wounded from the front, who ultimately reach the great civil hospitals. Considerable dismay, it is said, has been caused among the medical profession, and generally in England, by this recent call for more surgeons at the front. In addition, it is to be remembered that the majority of medical students and the more active younger physicians constitute those who have already volunteered, so that those who remain at home have not only double the amount of work to do, but are relatively less able physically to undertake it.

WAR RELIEF FUNDS.—On February 19 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$96,874.21
Serbian Fund	78,848.12
Allied Fund	63,350.80
French Wounded Fund	47,038.47
Armenian Fund	33,576.45
French Orphanage Fund ..	27,594.07
Polish Fund	20,445.56
Surgical Dressings Fund ..	19,704.55
La Fayette Fund	18,333.99

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending February 19, there were 255 deaths reported, with a rate of 17.49 per 1,000 population as compared with 283 and a rate of 19.72 for the corresponding week of last year. There were 2 deaths from influenza. Deaths from pneumonia and broncho-pneumonia numbered 45 against 39 last year.

There were 30 deaths under 1 year as compared with 48 last year, and 93 deaths over 60 years of age against 88 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 52; scarlet fever, 43; measles, 108; typhoid fever, 4; whooping cough, 32, and tuberculosis, 43.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 9; measles, 1.

Total deaths from these diseases were: Diphtheria, 4; scarlet fever, 5; measles, 1; whooping cough, 1, and tuberculosis, 19. Included in

these were the following non-residents: Scarlet fever, 4, and tuberculosis, 1.

HOSPITAL BEQUEST.—The will of the late Julia H. Copeland, of Middleboro, Mass., which was filed for probate at Plymouth, Mass., on February 15, contains a bequest of \$5000 to the Boston Floating Hospital.

INSTRUCTIVE DISTRICT NURSING ASSOCIATION.—The thirtieth annual meeting of the Boston Instructive District Nursing Association was held in this city on Wednesday, February 23. The treasurer's report was presented and officers were elected for the ensuing year. Scenes demonstrating the work were given by the nurses.

NEW SALEM HOSPITAL.—It is announced that plans have been prepared for the erection of a new building for the Salem Hospital, to be located on Lookout Hill, in a tract of 25 acres, with an unobstructed view of Salem Harbor.

"The plans call for a modern and scientific hospital building, with accommodation for 134 beds, and providing varying comforts, but the same expert care for private, semi-private, and ward patients, and for children and maternity cases. The basement is designed for an outpatient department, and for the necessary pathological, x-ray, sterilizing and other departments. The architects have skillfully arranged the rooms so that all shall enjoy the maximum amount of sunlight and air, with ample provision for outdoor beds as well.

"Fire-proof construction is to be used throughout. The elimination of wood is carried to a point where nothing but the windows and doors remain in that material. A completely equipped operating department will occupy a separate one-story building adjoining, with room also for an accident ward. A nurses' home has been planned, but will not be built immediately, though accommodations are provided for the men and women domestics, and there will be the usual laundries, storage rooms, and power-plant."

It is to be hoped that adequate funds for the early construction and future maintenance of this new hospital building may soon be available.

LAWRENCE GENERAL HOSPITAL.—The fortieth annual report of the Lawrence General Hospital records the work of that institution for the year ending August 31, 1915. The Ladies' Union Charitable Society, which conducts the hospital, has chosen for its president Mrs. Wilbur E. Rowell, who succeeds Mrs. S. F. Shackford, for forty years president of the society. A memorial tablet to Mrs. Shackford has been placed in the new Nurses' Home, which reads, "In loving

memory of Sarah Frances Shackford, during whose presidency this building was begun, and who died in office, Oct. 8, 1914." The superintendent reports a total of 1927 patients for the year. The out-patient department admitted 1481 patients in this time. Eight nurses were graduated from the training school, leaving 55 pupils still in training.

OPHTHALMIA NEONATORUM IN MASSACHUSETTS.

—Mr. Henry Copley Greene, Massachusetts Field Agent for Conservation of Eyesight, reports that so far as is known, only one child in this state has become blind from ophthalmia neonatorum during the year ending Dec. 1, 1915. No recent report has given greater encouragement to workers in the field of prevention of blindness, proving as it does the value of continued intelligent work. Massachusetts has maintained an organized conservation of vision movement longer than any of the states.

BOSTON CITY HOSPITAL ALUMNI ASSOCIATION.

—The twenty-seventh annual meeting and dinner of the Boston City Hospital Alumni Association were held in Boston on February 23, under the presidency of Dr. Robert W. Lovett. During the forenoon there were operations and ward visits at the hospital, and the following papers and demonstrations were presented in the surgical amphitheatre by members of the staff.

"Chemical Tests in Nephritis," Dr. James P. O'Hare. "Remarks on High Frequency Cauterization of Bladder Tumors," Dr. Horace Binney. "The Present Status of the Boston City Hospital," Dr. George G. Sears. "The Hospital and Workmen's Compensation," Dr. Frederic J. Cotton. "The More Efficient Treatment of Colles' Fractures," Dr. Halsey B. Loder. "Recent Progress in the Management of Contagious Diseases," Dr. Edwin H. Place. Luncheon was served by the trustees in the Hospital Library at 1 p.m., and the entire Hospital was open for inspection throughout the day. At the dinner in the evening at the Copley-Plaza Hotel, the following gentlemen were present as guests and made addresses: Hon. George von L. Meyer; Hon. John A. Sullivan, Corporation Counsel of the City of Boston; Dr. Walter B. Cannon, Professor of Physiology at Harvard University; Dr. Ansel G. Cook, of Hartford, Conn.

Miscellany.

MORTALITY FROM CANCER IN THE WESTERN HEMISPHERE.

DURING the recent sessions of the second scientific Pan-American Congress at Washington, D. C., Mr. Frederick L. Hoffman presented, on Jan. 7, an address on the mortality from cancer

in the Western Hemisphere. The following abstract of this address seems to deserve publication in view of its relation to the important questions of the incidence and distribution of this disease:—

"Following a brief discussion of American mortality problems, with special reference to the decline in the death rate from many important diseases, the speaker emphasizes the suggestive fact that cancer is one of the few diseases with regard to which the statistical evidence seems entirely conclusive that the mortality rate is on the increase through practically the entire civilized world. He, therefore, maintains that the disease demands more serious consideration on the part of the medical profession and the general public, in conformity to the principles laid down by the American Society for the Control of Cancer, organized in 1913. The estimated mortality from cancer in the continental United States for 1915 is given as 80,000, of which 32,000 deaths are of males and 48,000 deaths are of females. Excluding deaths from cancer of the generative organs and of the breast, the rates for the two sexes, in the registration area of the United States, are stated to be about the same. The rate is somewhat higher in urban centers, when compared with the population of rural districts, but in part this difference is accounted for by deaths in institutions; but it is suggested that further statistical inquiry, with a due regard to the age distribution of the population, might disclose more important differences than are shown by death rates not corrected for age and sex.

"Emphasis is placed upon the race factor, as illustrated by a white cancer death rate for 30 Southern cities of 80.3 per 100,000 of population, and a rate of 55.2 for the colored. It is stated that there has been a considerable increase in the negro cancer death rate since the Civil War, and particularly so in the case of cancer of the uterus. The cancer mortality rates of the Eastern and Western Hemispheres are compared with reference to latitude, and apparently the evidence is fairly conclusive that there is a decreasing rate of frequency with diminishing distances from the Equator. For the Eastern Hemisphere the rate is given as 98.3 and for the Western Hemisphere as 78 per 100,000 of population. These rates are naturally affected by the conditions of life of the populations considered, and there would seem to be a very close relation between cancer frequency and the attained degree of material civilization. At least as far as the data can be relied upon, cancer is extremely rare among native races, such as the North American Indians, the Esquimos, and the negroes of the West Indies. The relation of wealth and poverty to cancer is illustrated by a very interesting analysis of the data for Edinburgh, Scotland, which seem to prove that cancer is decidedly more common among the well-to-do than among the poor, while, in contrast,

tuberculosis is largely a disease of poverty. This rather interesting conclusion seems further confirmed by the statement that cancer is more common among those who are overweight in comparison with those who are underweight.

"As regards the effect of marriage, some new statistics for England and Wales are referred to as tending to prove that cancer of the female breasts and the ovaries is of greater frequency among the unmarried, whereas cancer of the uterus is more common among the married. It is suggested that further statistical inquiry into this particular aspect of the cancer problem would yield results of much practical importance.

"With reference to the important question of the increase in cancer, attention is directed to the data for England and Wales, which, for the period 1901-1913, show an increase in the cancer death rate at every differential period of life except ages 5 to 14. The increase has been most pronounced, however, at ages over 55.

"The geographical distribution of cancer throughout the Western Hemisphere is considered at some length, with special reference (1) to the larger states and areas, and (2) to the principal cities, for which, naturally, the data are more conclusive.

"Concerning the cities located in the tropical belt of the Western Hemisphere—that is, between latitude 10° north and 20° south—a wide disparity is shown to exist between the maximum rate of 104.8 for Caracas and 21.8 for La Paz per 100,000 of population. Whether there is any relation between cancer and altitude has not yet been determined.

"The most suggestive new data are the comparative cancer rates, by organs and parts, for three large cities of North America and four large cities of Central and South America. The cities considered are New York, New Orleans, San Francisco, the City of Mexico, Rio de Janeiro, Montevideo, and Buenos Aires. The comparison emphasizes the fact that a relatively low general cancer death rate is generally due to the rarity of cancer of certain specified forms or parts, and not necessarily to common errors in diagnosis or incompleteness of death certification. Attention is directed to the extremely high mortality from cancer of the stomach and liver in Montevideo and Buenos Aires. In a subsequent discussion, a comparison is presented from the United States registration area and Uruguay. It is shown that the male cancer death rate for the United States is 55.7 per 100,000 of population, against a rate of 73.2 for Uruguay; but the female cancer death rate is distinctly higher for the United States, being 90.6, against 58.6 for Uruguay. The excess in the female cancer death rate is largely due to the higher mortality from cancer of the female breast and the female generative organs.

"In conclusion it is stated that, 'in contrast to the comparative rarity of cancer in many of the countries and islands of Central and South

America, the discussion draws attention to the excessive frequency of the disease in such cities as Buenos Aires and Montevideo, where it has been shown that cancer is even more common than in cities of corresponding size in the northern portion of the Western Hemisphere. In this direction also the outlook is encouraging that further statistical research, amplified by medical and anthropological studies, and most of all, by thoroughly qualified studies of metabolism, diet, and habits of life, would yield results of considerable practical importance. Accepting as conclusive the recorded rate of excessive cancer frequency for many of the countries and states of the Pan American Union, it would, furthermore, seem of the utmost urgency that the attention of these countries should be directed to the principles and methods of the American Society for the Control of Cancer, as a first step in the direction of an effective public education in the essential cancer facts preliminary to an ultimate reduction in the mortality from malignant disease throughout the Western Hemisphere.'"

NEW YORK CITY'S POPULATION, AND THE STATE CENSUS.

THE Department of Health feels that the population figures returned by the recent New York State census of July, 1915, do not constitute a satisfactory basis for the calculation of births, deaths or marriage rates of the City, or for other statistical purposes dealing with the department activities.

In round numbers the population figures returned by the state census are 5,047,000. The United States Census Bureau, using the arithmetical method of calculation, estimated the population of the city on July 1, 1915, as 5,585,772. The reason for this large divergence lies mainly in the fact that the purpose of the state census was to furnish a basis of apportionment of the state population for redistricting the state Senatorial representation. For this reason, the state census enumeration in this city did not include:

(a) Persons attached to Federal government reservations.

(b) Persons who did not have a permanent residence in the city, such as the transient guests in the numerous hotels in Manhattan.

(c) Inmates of institutions, other than homes, private asylums, and Catholic institutions, who had their permanent places of abode outside of the election districts where such institutions were situated. Such persons were not counted as of the institutions because it was understood that they were counted at their permanent abode.

To these three classes, the Department of Health would add

(d) Well-to-do persons who could not be located because already out of town for the summer, and concerning whom no information could be obtained from other sources.

(e) Persons who left the city for the summer, giving up their apartments, and placing their household goods in storage.

(f) Persons, like day laborers, who regularly leave the city for out-of-town employment with the onset of the summer, but whose home in winter is in this city.

The Department of Health has applied a number of well-established tests to check up the reliability of the state enumeration and of the various estimates that have been made. One of the best of these tests is that furnished by the number of births occurring in the community. Last year 141,356 births were reported in the city of New York. There is no reason, whatever, to believe that the birth rate last year was higher than the rate in 1910 (the last census year), at which time it was 26.87 per thousand of the population. In fact, those most familiar with New York City conditions believe that the rate was considerably less. Practically in all civilized countries the birth rate has steadily declined in the past ten or fifteen years. If we assume that the birth rate was 25 per thousand during 1915, calculations from the actual number of births recorded, namely, 141,356, indicate that New York City's population during 1915 was approximately 5,650,000. It will be noted that this figure approaches closely the figure arrived at by the United States Census Bureau, using the arithmetical method of calculation for 1915, namely, 5,585,772.

A further reason for considering the estimate above proposed as entirely reasonable and conservative is furnished by comparing the figures for New York and Boston. Thus in the past five years, Boston's population has increased 9%, as determined by the Federal enumeration of 1910 and the state enumeration of 1915. From 1900 to 1910 Boston's population increased by 19%. The New York City increase from 1910, as shown by the state census of 1915, would credit New York City with a growth of but 5.9%, while past experience has shown that New York City has grown at a faster, and not a slower, rate than Boston, for in the ten years from 1900 to 1910, New York City's population increased 38%.

While the state census credits New York City with a growth of only 5.9%, it credits the state of New York, outside of the city, with a growth of 6.8% from 1910 to 1915, a reversal of the relation which has always existed in the past. It is preposterous to declare that the state outside of the city of New York grew between those years at a rate greater than that of the city.

A further evidence of inconsistency is readily obtained by a study of the records of births and deaths in the Department of Health of this city. There were 306,000 more births than deaths in

New York City in the period 1910 to 1915, and yet the state census enumeration credits New York City with a total increase of only 280,000. What has become of the 26,000 thus unaccounted for?

We are similarly interested in the fate of the 1,070,000 more immigrants than emigrants recorded as having passed through the port of New York in the years 1910 to 1914, up to the beginning of the European War, and destined to the state of New York. Experience in the past has been that not less than 50% of the immigrants arriving at this port have remained in this city. Where are these 535,000 alien immigrants? Finally we must consider that the trend of the movement of the population for many years has been from rural districts to the city. No attempt has been made to estimate the constant addition to the population from this source, because of the impossibility to secure accurate data.

In view of the above considerations, the department feels that the estimate of population for this city, arrived at by the arithmetical method of computation, which is that employed by the United States Census Bureau, most nearly represents the actual population of the city at the present time, and it will, therefore, use this method as the basis of its vital statistics until 1920, the year of the next federal census. Using the population figures thus obtained, the population for 1915 and 1916, respectively, is as shown in the following table:

	1915	1916
Manhattan	2,575,788	2,622,684
The Bronx	601,266	633,961
Brooklyn	1,932,690	1,989,971
Queens	376,138	393,820
Richmond	99,890	102,563
City	5,585,772	5,742,999

On the basis of these figures, the death-rate for 1915 was 13.61.

APPOINTMENTS.

BOSTON LYING-IN HOSPITAL.—At a meeting of the trustees of the Boston Lying-in Hospital on February 10 the following staff was appointed for the year beginning March 1, 1916:

Consulting physicians: William L. Richardson, M.D., J. Collins Warren, M.D., Charles M. Green, M.D., William P. Graves, M.D., Fritz B. Talbot, M.D., Assistant visiting physicians: Franklin S. Newell, M.D., (acting visiting physician); Howard T. Swain, M.D., James R. Torbert, M.D., Nathaniel R. Mason, M.D., Robert L. DeNormandie, M.D., Robert M. Green, M.D.

Physicians to out-patients: James R. Torbert, M.D., James L. Huntington, M.D., John B. Swift, Jr., M.D., Frederick C. Irving, M.D., Foster S. Kellogg, M.D.

Assistant physicians to out-patients: Robert C. Cochrane, M.D., Delbert L. Jackson, M.D.

Superintendent: Miss Charlotte W. Dana.

Assistant superintendent: Miss Ethel S. Gray.

Board of lady visitors: honorary member, Mrs. James G. Freeman; Mrs. Charles H. Gibson, Mrs. J. D. Cameron Bradley, Mrs. Edward D. Brandegee, Mrs. John Dudley Clark, Mrs. Francis B. Crowninshield,

Mrs. Franklin Dexter, Mrs. Francis L. Higginson, Miss Adeline D. Hooper, Mrs. Henry Parkman, Mrs. Neal Rantoul, Mrs. William D. Sohler.

PRINCETON UNIVERSITY.—Dr. Clarence W. Farrar, formerly superintendent for the State Hospital for the Insane at Trenton, N. J., has been appointed lecturer on abnormal psychology at Princeton University.

NOTICE.

THE MARY PUTNAM JACOBI FELLOWSHIP.

The Woman's Medical Association of New York City offers the Mary Putnam Jacobi Fellowship of \$800, available for post-graduate study. It is open to any woman physician for work in any of the medical sciences.

The fellowship will not be awarded by competitive examination, but upon proof of ability and promise of success in the chosen line of work.

Applications for the year 1916-1917 must be in the hands of the Committee on Award by April 1, 1916, and must be accompanied by:

1. Testimonials as to thoroughly good health.
2. Letters as to ability and character.
3. A detailed account of educational qualifications.
4. A statement of the work in which the applicant proposes to engage while holding the fellowship.
5. Examples, if any, of her work, in the form of articles or accounts of investigations which she has carried out.

Two reports will be expected from the holder of the fellowship, one to be presented about the middle of the work and a detailed report for publication upon its completion.

All applications for this fellowship shall be forwarded to the committee.

ANNIE S. DANIEL, M.D., *Chairman*,
26 Gramercy Park, New York City

SOCIETY NOTICES.

There will be a Medical Meeting in the Amphitheatre of the Peter Bent Brigham Hospital, on Tuesday evening, February 29, at 8.15 o'clock.

PROGRAM.

1. Exhibition of Cases.
2. The Respiration Calorimeter in Clinical Medicine. Dr. Eugene F. Du Bois of New York. (Medical Director of the Respiration Calorimeter of the Russell Sage Institute of Pathology at Bellevue Hospital).

Medical students and physicians are cordially invited. Telephone, Brooklyn 5260. Any visitors may be on telephone call if their names are left at the front office of the hospital.

NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren street, Roxbury, Tuesday, February 29, at 8 p.m. Communications:

A Peculiar Type of Foreign Body in the Oral Cavity, J. L. Lougee, M.D.

A Report on sixteen cases of "Twilight Sleep," A. E. Sherburne, M.D., and T. F. Greene, M.D.

BRADFORD KENT, M.D., *Secretary*.

THE HARVEY SOCIETY.—The seventh lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third street, on Saturday evening, February 26, 1916, at 8.30 o'clock, by Prof. Warfield T. Longcope, Columbia University. Subject: The Susceptibility of Man to Foreign Proteins.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting of the Surgical Section will be held on March 8, at 8.15 p.m., in the Boston Medical Library. Dr. E. Starr Judd of Rochester, Minn., will present a paper upon "Choleliths With and Without Stones."

CHARLES L. SCUDDER, M.D., *Pres't*.

RECENT DEATHS.

DR. JOHN ABBOTT DOUGLASS, a retired Fellow of The Massachusetts Medical Society, died at his home in Amesbury, Mass., Feb. 4, aged 87 years. He was born at Waterford, Me., graduated from Bowdoin College in 1854, and from the College of Physicians and Surgeons, Columbia, in 1861. He was assistant surgeon in the 11th Massachusetts Regiment in the Civil War, and was a Councilor of The Massachusetts Medical Society for many years, being constant in attendance at meetings.

DR. JAMES W. GREGG, 72, died suddenly Feb. 2, 1916, in his new home on Northern avenue, Brattleboro, Vt. He had been a medical practitioner in Brattleboro for about 40 years. Death was due to a severe attack of heart disease of about an hour's duration. Dr. Gregg was a native of Scotland, and was born March 20, 1843. He came to this country in his boyhood, and since then had always lived in Vermont. He was a graduate of the medical department of Dartmouth College in 1867, and located first in South Ryegate, going from there to Brattleboro.

Dr. Gregg was a man of character and integrity, and enjoyed the respect of the community. Besides his widow, who was Miss Luthera Cochran of Ryegate, he leaves four children, Miss Emma J. Gregg, and Robert C. Gregg, who live at home, the former for a long time a teacher of music in the schools of Brattleboro. Lewis A. Gregg of Springfield, Mass., manager of the Charles Hall china and art store, and Miss Madeline A. Gregg, a school-teacher in New Bedford.

DR. BENJAMIN FRANKLIN RICHARDSON, a Fellow of the Massachusetts Medical Society, died at his home in Lynn, Mass., February 16, 1916, aged 52 years. He was born in Middleton and was educated at Phillips Andover Academy and at the Harvard Medical School, graduating from the latter in 1886. He was unmarried.

SCHOOL FOR HEALTH OFFICERS.

SPECIAL LECTURES IN MARCH.

All lectures will be given from 5 to 6 o'clock on the dates specified and in the amphitheatre of Building E of the Harvard Medical School, unless otherwise indicated. All lectures will begin promptly on the hour.

March 1. * "Mental Hygiene." Dr. Southard and assistants.

March 2. "Topics in Optics" (3 lectures). Dr. Theodore Lyman, Director of the Jefferson Physical Laboratory, Harvard University.

March 3. "Personal Hygiene." Prof. W. B. Cannon.

March 6. "Municipal Sanitation" (3 lectures). Dr. C. V. Chapin, Supt. Board of Health, Providence, R. I.

March 7. "Topics in Optics." Dr. Theodore Lyman.

" 8. "Personal Hygiene." Prof. W. B. Cannon.

March 9. "Topics in Optics." Dr. Theodore Lyman.

March 10. * "Mental Hygiene." Dr. E. E. Southard and assistants.

March 13. "Municipal Sanitation." Dr. C. V. Chapin.

March 14. "Ocular Hygiene" (2 lectures). Dr. F. H. Verhoeff, Instructor in Ophthalmic Pathology, Harvard Medical School.

March 15. "Ocular Hygiene." Dr. F. H. Verhoeff.

" 16. "Illumination." Dr. Louis Bell.

" 17. "Illumination." Dr. Louis Bell.

" 20. "Municipal Sanitation." Dr. C. V. Chapin.

March 23. "Social Service" (1 lecture). Dr. Richard C. Cabot, Assistant Professor of Clinical Medicine, Harvard Medical School.

* Lecture to be given at the Psychopathic Hospital 74 Fenwood Road, Boston.

The Boston Medical and Surgical Journal

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Original Articles.

RELATION OF DULNESS TO CARDIAC OUTLINES.*

BY GEORGE CHEEVER SHATTUCK, M.D., BOSTON.

In recent years the tendency has been toward outlining the heart by means of light percussion. Heavy percussion has been discarded except by a few. The multiplicity of methods of percussing which are still recommended points to the conclusion that none is satisfactory.

In order to compare the results of different methods it is necessary to have a means of checking percussion outlines, and the x-ray offers the best means. Percussion as generally employed consists of two processes carried on simultaneously. The first is the detection of diminished resonance; the second is judgment as to whether or not this change corresponds with the heart-border. Accurate weighing or measuring involves no such dual process. It practically eliminates the subjective and the result is almost purely objective. Percussion is largely subjective because judgment is an important factor in the result.

I have attempted by teleroentgenography to check ordinary light percussion, using it objectively with reference to sound, disregarding resistance, and abstaining, as far as possible, from

allowing knowledge of anatomy or other evidence to influence the result.

Before taking the x-ray, the outlines of slight diminution of resonance (*i.e.* slight dulness) were determined by light percussion and marked with wires stuck to the chest wall with adhesive plaster.

The slides which I shall show were prepared from x-ray plates taken with the tube at from six to seven feet from the plate to avoid magnification by giving nearly parallel rays. The plate lay against the patient's chest, in front, the tube was behind him. The patient was standing and the pictures were taken at mid-respiration, not full respiration because the latter alters the relation of the heart to other structures.

FACTS ILLUSTRATED IN SLIDES.

Slides Nos. 1, 2 and 3 show that the outer limits of very slight dulness do not correspond closely with the heart-borders as seen in the x-ray.

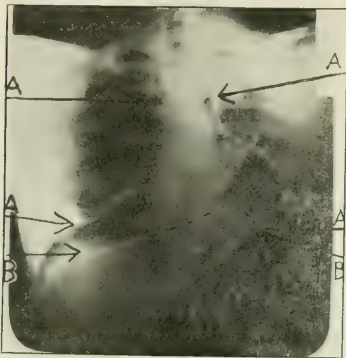
Slide No. 4 shows that neither very slight dulness, moderate dulness nor flatness alone serves to outline the heart.

Slide No. 5 shows that even when the chest is large and of average proportions, definite dulness appears on the left lateral curve with a heart of normal size.

Slide No. 6 shows that the location of the borders of the heart may be judged pretty accurately by percussion plus other methods of examination, but that the greatest difficulty is at the apex when we want our outline to correspond with that seen in the x-ray plate, and that this difficulty exists even when the chest is large and broad.

* Read in part at the meeting of the Mississippi Valley Medical Association, Lexington, Kentucky, October, 19, 1915.
Simultaneous publication by courteous permission of the *Lancet-Clinic*.

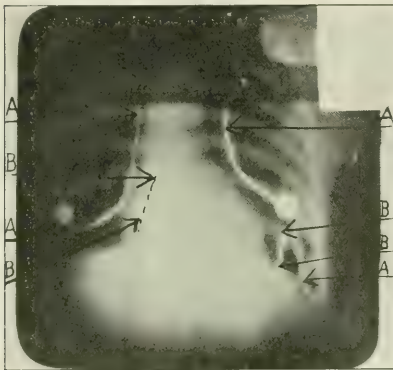
Slide No. 7 shows that a very accurate estimate of the position of the heart can be made in a large and well-proportioned chest even when the outline of very slight dulness is quite different from the x-ray outline.



SLIDE No. 1.

Lines AA indicate very slight dulness determined by percussion.
Line BB shows absolute dulness: dotted in part.
Chest broad, but heart moderately enlarged.
Apex sixth space.

Slide No. 8 shows an equally successful cardiac outline in an abnormal chest with an unusual type of heart. The apex impulse gave the best evidence of the position of the left border in this instance.



SLIDE No. 2.

Lines AA indicate very slight dulness.
Lines BB indicate moderate dulness.
Chest small and rounded. Heart of normal size, but dulness to left extends onto the side of the chest, so that part of the lateral chest wall lies between the marker and the cardiac apex, which makes the percussion appear less accurate than it is in fact.

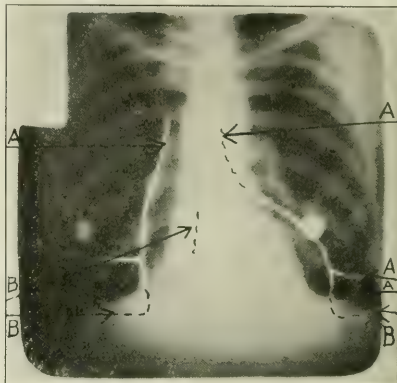
DISCUSSION OF SUBJECT.

My outlines of dulness do not correspond with the silhouette outlines of the heart as shown in the x-ray. The reasons for this fall into two groups:

First, relative dulness near the heart may be produced by structures other than the heart.

Second, slight cardiac dulness, even when the heart is of normal size, generally extends toward the axilla, so that outlines which follow closely the borders of slight dulness fall of necessity upon a curved surface.

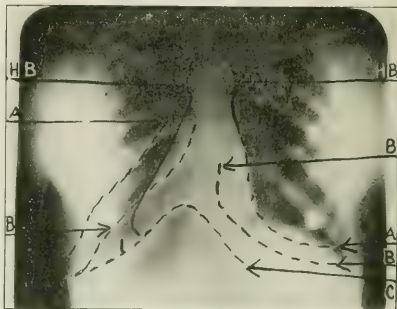
To expect such an outline to correspond on the left with the shadow of the heart produced by parallel rays on a flat surface, or with an orthodiagraph of the heart would be unreasonable. A square peg can be fitted to a round hole



SLIDE No. 3.

Lines indicate slight dulness and moderate dulness as in No. 2.
Wires dotted in part.
Chest very narrow in front so that dulness extends onto the curve of the side both to right and left.

by whittling it down. Similarly, it is possible to obtain an outline of the heart which will correspond with the x-ray shadow, but to do this the

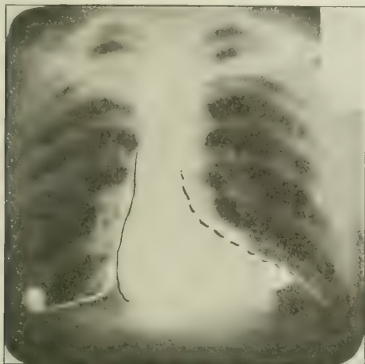


SLIDE No. 4.

Shows relations of three degrees of dulness to heart-borders in a narrow chest.
AA—Very slight dulness: wire dotted.
BB—Moderate dulness: wire dotted.
CC—Absolute dulness: wire dotted.
HB—Heart border.

lines of slight relative dulness must be abandoned in part, and the markers must be replaced

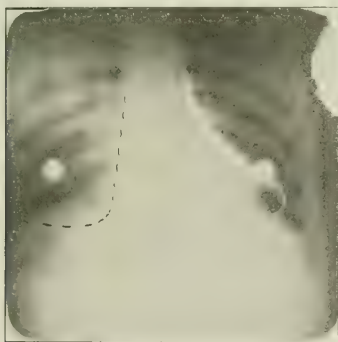
with due regard to peculiarities of resonance,—which experience teaches one to expect in the individual under examination. When making such an outline, the sense of resistance in percussing, and the position of the apex impulse as shown by palpation are helpful, and familiarity with the common types of heart-outline as seen in the x-ray is important. In other words, when attempting to make percussion conform to the x-ray, it is well to obtain information not only from slight changes of sound but also in other ways.



SLIDE No. 5.

Chest large and of average proportions, and yet dulness to left extends onto curve of side. Heart normal in size. Lines indicate *slight*, not very slight dulness. Right border marked with line. Left wire dotted.

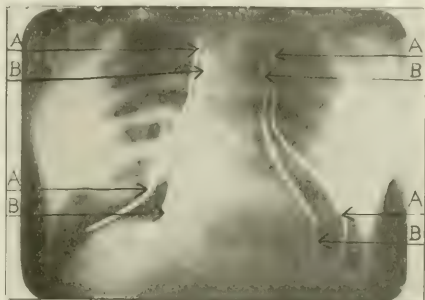
The fact that the percussion-outline of slight dulness does not correspond near the apex to the x-ray outline does not signify that the percussion-outline of dulness is wrongly placed. *Slight*



SLIDE No. 6.

Lines indicate *not* percussion outline but judgment as to probable position of heart-borders. Judgment was based not only on percussion but also on other evidence obtained by physical examination. Dulness to left again extends to curve of side, and in placing the wire at this point not enough was allowed for this fact. Wires at other points follow the heart-border very closely. Chest large and broad.

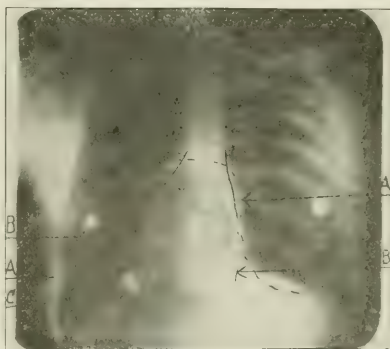
dulness on a curved surface cannot correspond with the x-ray at this point *when ordinary light percussion* is used.⁹ It gives a magnified outline of the heart (Fig. 2). The border of marked dulness, or that of flatness on the left, comes



SLIDE No. 7.

Lines AA indicate very slight dulness. Lines BB indicate judgment of probable position of heart-borders based not only on percussion but also on other evidence. Border coincides. Chest large and well proportioned. Fig. 2 from same case.

much nearer to it and, therefore, these should be used as guides when attempting to make a silhouette outline of the heart. The palpable impulse can then be used as a check.



SLIDE No. 8.

Lines AA indicate very slight dulness. Wire dotted. Lines BB indicate judgment of probable position of borders. Wire marked with line. Border coincides. Circle C shows palpable apex impulse which helped to locate left border correctly. Chest small and very narrow in front. Heart of "drop-like" type.

By using such combined methods I have often obtained outlines of the heart corresponding closely with the x-ray, but it is difficult and success in my hands is uncertain.

Locating the right border is much easier, as shown by the work of Dietlen,¹ Treupel,² and others, but even Treupel, whose results are the best I know of published in original measurement, was content to count as correctly outlined cases in which errors occurred of less than one

centimetre. Personally, I am often in doubt as to the position of the right border of the heart and therefore rely on several signs rather than on slight dullness alone. The extent of absolute dullness to the right, or accentuation of the pulmonary second sound, may give evidence of enlargement.

It seems to me, therefore, a mistake carefully to measure ordinary percussion outlines and to draw inferences from them alone as to the pres-

tion they were made, and whether around the chest to the left, or from a perpendicular from the frontal plane to the line of dullness on the chest-wall. Compare ML X and ML Y, Fig. 2.

Measurements of percussion outlines on the left to fractions of a centimetre are not scientific because they imply a degree of accuracy which ordinary percussion cannot yield with reasonable certainty.

When using percussion to determine heart-size it is not necessary to be content with a single outline of dullness. One can determine the limits of slight dullness, of moderate dullness, and the borders of superficial flatness, and at the same time take note of varying degrees of resistance. The sum of this evidence gives to a certain extent a stereoscopic picture of the relations of the heart to the chest-wall, and from this, conclusions as to its size and shape can be drawn. Whereas the findings should be compared, not with absolute heart-size, but with standards of the normal based on individual experience, it is not essential to determine absolute heart-size, nor is it necessary that all physicians should percuss in the same way or that they should make the same outlines. When examiners are equally experienced and equally expert, their conclusions as to the presence or absence of demon-

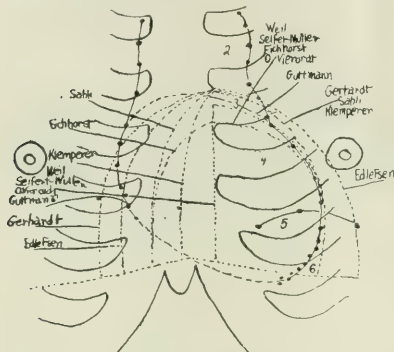


FIG. 1.—From Moritz: *Deut. Arch. f. klin. Med.*, Vol. 88, p. 277, '06-'07.

ence or absence of slight enlargement. To do so is to assume a degree of accuracy not attainable with certainty.

I believe that the findings of ordinary percussion should be recorded in the terms of their relations to anatomical lines, such as the parasternal line on the right and the mid-clavicular or anterior axillary line on the left and to interspaces. A record of this sort is scientific because it represents facts, and it is more useful for judging of the normality or abnormality of the heart than is a measurement which does not take into account the weight of the patient or the shape of his chest.

As a general rule, broad hearts are found in broad chests and narrow hearts in narrow chests. Heavy people have relatively broad chests and large hearts, and thin people relatively narrow chests and narrow hearts or broad, flat chests with wider hearts. In these types the shape and position of the normal heart seem to bear a pretty constant relation to the shape of the chest; and it is, I think, for this reason that interspaces and anatomical lines are valuable as indices of heart size.

Measurements from ordinary percussion are useful to compare changing conditions in an individual at different times, or in conjunction with descriptions of the relations of dullness to interspaces, mid-clavicular line, and the like. Recorded measurements should always be made with the patient in the same position and in the same way, and it should be known in what posi-

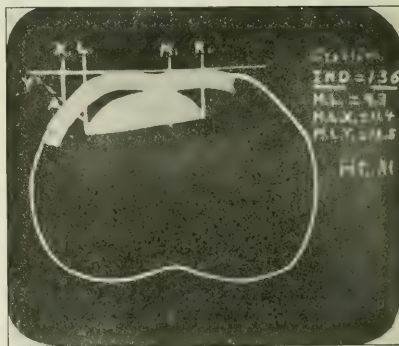


FIG. 2.—M.L.=9.3=actual measurement from x-ray plate. M.L.X=11.4=perpendicular measurement to dullness on chest-wall. M.L.Y=12.5=measurement around chest to same point. Chest index=1.36. Average index in 34 cases=1.33. Therefore, this chest is of nearly average shape. The case is the same as that from which Slide No. 7 was made.

Distances from anterior plane to apex, front of heart and right border were taken from average measurements from six frozen sections. M.L. and M.R. are the actual measurements from the x-ray plate.

ble enlargement are likely to coincide even though their methods be very different. Before the advent of the x-ray, few attempted, or expected, to make on the chest a silhouette outline of the heart by means of percussion. The great variance in the teaching about the percussion outline of the normal heart was shown by Moritz³ who published an excellent diagram of the heart with superimposed curves of cardiac dullness

from standard authors (Fig. 1.) There seems little reason to doubt, however, that these eminent clinicians were as competent as most of us to detect enlargement of the heart by percussion. It does not follow, however, that they were able to discover comparatively slight enlargement, or that their methods were equally good, or that they had a definite idea of the relations of their outlines to the actual heart-size. To do these things without the aid of the x-ray would have been most difficult, but they can all three be done now with comparative ease.

Moritz,⁴ Dietlen,¹ Treupel,² and some others who worked much with the orthodiagraph seem to have assumed that it was the function of percussion to provide a silhouette outline of the heart which could be measured like an orthodiagram, so that the measurements could be compared with standards based on orthodiagraphic work. They succeeded by special methods to a surprising extent in accomplishing this object, and their methods should be generally adopted if they prove to be practicable for general use. Not having had the opportunity as yet to give these methods a fair trial, I am not willing to condemn them, but neither am I convinced that they would be valuable in the hands of men less expert in their use or less familiar with orthodiagraphic work than were the advocates of these methods. The methods in question are that of Moritz,⁶ a modification of light finger percussion, the "touch percussion" of Ebstein,⁷ and the "threshold percussion" and "orthopercussion" principles of Goldscheider.⁸

I am inclined to doubt the wisdom of generally adopting these methods because they seem to me to add more difficulties to an already complex problem, and because they tend to give the impression of greater accuracy than necessarily exists. I mean to discuss at another time the percentage of error and the limits of error of these methods when used by the most expert.

CONCLUSIONS.

The following conclusions seem warranted regarding ordinary percussion:

First: It easily reveals gross abnormality in cardiac dulness to right or left.

Second: It may suggest slight abnormalities which must then be confirmed or disproved by other means.

Third: When percussion indicates slight cardiac enlargement, or no enlargement, palpation, auscultation, blood-pressure, or history may provide further evidence of importance which can be used to check the results of percussion.

Fourth: When doubt still remains, teleoroentgenography or the orthodiagraph may be of service; but it should be remembered that variations of heart-size are dependent on many factors, and that the average man does not exist. Moreover the errors of these methods in the hands of one who does not appreciate their difficulties, when applied to the heart, are large.

Fifth: Percussion is especially unreliable for finding slight enlargement of the aortic arch, for determining the level of the apex, and for discovering hypertrophy of the left ventricle when there is little or no dilatation. Palpation in the left lateral position is often helpful for solving the last two problems, and accentuation of the aortic second sound, or increase of blood pressure should not pass unobserved.

Sixth: It is not worth while to attempt by ordinary percussion methods to make a silhouette outline of the heart. It is better to note the relations of dulness in terms of interspaces and anatomical lines, and to compare the findings with a subjective standard based on experience, than to judge of enlargement by measurements of ordinary percussion outlines and comparison of them with orthodiagraphic standards.

Seventh: The attempt to make silhouette outlines of the heart by means of special methods of percussion has shown, in the hands of a few, results which are good but more or less uncertain.

Many thanks are due to Drs. Walter J. Dodd and George W. Holmes for help and for valuable suggestions as well as for doing the x-ray work upon which my studies were based.

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- ¹ Dietlen: (a) *Deut. Arch. f. klin. Med.*, Vol. 88, p. 55, '06-'07; (b) *Ibid.*, p. 287; (c) *Verhand. d. Cong. f. Inn. Med.*, Vol. 23, p. 267, '06.
- ² Treupel: *Munch. med. Woch.*, Vol. 54, p. 972, '07.
- ³ Moritz: *Deut. Arch. f. klin. Med.*, Vol. 88, p. 277, '06-'07.
- ⁴ Moritz: *Deut. Klinik.*
- ⁵ Moritz: *Deut. Arch. f. klin. Med.*, Vol. 88, p. 276, '07.
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- ⁷ Ebstein: *Die Tasterpercussion*, Stuttgart, 1901.
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NEUROLOGICAL SURGERY IN A WAR HOSPITAL.

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American Ambulance, Paris, April, May and
June, 1915.

OF THE total 441 cases under our care during the three-month service in the American Ambulance Hospital, Paris, 64 cases or 14.5% of the total presented lesions of essentially neurological interest. There were 67 different lesions in the 64 cases. The injuries in a majority of all cases were very similar to those seen in civil life in any active accident-ward service, only the destruction of tissue as a rule was far greater. The problems presented by gunshot injuries of the head are those of any compounded cranial fracture plus the possibility of a retained foreign body, and those of peripheral nerves concern the immediate care of the wound and judgment as to how long to wait before doing an aseptic secondary operation.

Although the period during which we observed these cases was brief, and improvement after injuries of the nervous system is often slow, still in this group of cases recovery after operation, even for badly lacerated wounds of the brain, occurred in a surprisingly short period of time.

We have divided the cases into five distinct groups following the natural anatomical divisions. These groups include lesions of the cerebrum, cerebellum, spinal cord, sympathetic nervous system and peripheral nerves. There were 15 cerebral lesions, 3 cerebellar, 7 of the spinal cord, 1 of the central sympathetic, and 39 of peripheral nerves. Of the total number of cases in this series, 25 underwent operation. The majority of these cases had been subjected to some previous surgical measures of one sort or another, though a few men with cerebral injuries reached us with the original simple "pansement" of the "Poste de secours" still in place.

The missiles causing the injuries were divided as follows: rifle ball 32, shell fragment 20, shrapnel ball 6, bomb fragment 2, shell explosion resulting in the caving-in of a trench or hut 4. In addition, 2 musculo-spiral nerve paralyses were due to fracture from falls without wounds. The types of wounds were: perforating 25, penetrating 7, and simple wounds 26. In this summary are not included simple skull injuries without neurological symptoms, of which there were several examples.

I. Cerebral Injuries. In this series there were 15 cases with definite neurological symptoms. One was a simple concussion without fracture received in a mine explosion. There were the usual symptoms of disorientation, perturbation and shock which soon cleared up. There was one fractured skull with slight bony loss due to a gutter fracture by a rifle ball with some depression of the inner table. In this case the injury was almost exactly at the mid-point of the vertex and there was the peculiar spasticity of the lower limbs and increased reflexes characteristic of injuries in this region, so thoroughly described by Sargent and Holmes¹ in a recent article.

There were 12 cases with a loss of bony substance. The cerebral regions injured were as follows: occipital 2, frontal 2, low parietal 5, and high parietal (vertex) 5. In 9 cases there were distinct localizing symptoms. Thus both of the occipital wounds were associated with loss of vision in a varying degree and in one (Fig. 1.) in which one occipital lobe was almost entirely destroyed, there was a homonymous hemianopsia. In 6 of the 10 parietal cases there was a temporary but fairly complete hemiplegia and in one case of left parietal laceration (Fig. 2.) a complete aphasia accompanied the hemiplegia. Headache was present in every case

and a measurable choked-disc in 8 of the 15 cases (Fig 3).

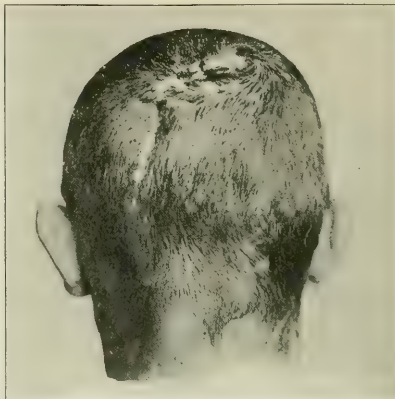


FIG. 1.—J. P. Shell-fragment wound, destruction left occipital lobe; four weeks after injury. Homonomous hemianopsia.

Seven of the cerebral cases were operated upon. In only 3 was a foreign body recovered. On two occasions the magnet was successfully used to extract the missile and no anaesthetic was necessary. The first of these had been previously trephined and there was an opening on



FIG. 2.—H. L. Two weeks' post-operative, showing curved incision to permit decompression and exploration of wound of brain; drained.

the vertex about 1 inch in diameter. The patient entered the hospital 3 weeks after his injury and had headache, a slight degree of choked-disc and some temperature and leucocytosis, evidently signs of a small abscess. Some 6 cm. below the inner table a small piece of shell fragment was disclosed by the fluoroscope. Under ether the foreign body was felt but could not be easily grasped, but was easily extracted with the magnet. The wound was drained and the patient made a perfect recovery.

¹Holmes, G., and Sargent, P.: British Medical Journal, Oct. 2, 1915.

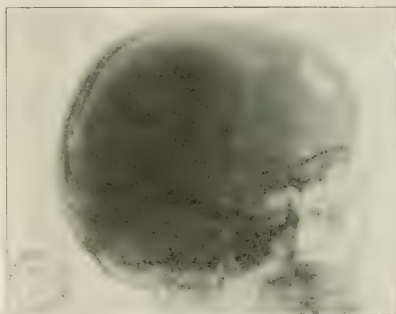


FIG. 3. P. Two weeks' post-operative, showing subtemporal decompression incision through which brain was cleaned up and original site of injury which was drained.

The second of these cases (Figs. 4 and 5) was more difficult as the shell fragment was found to rest close to the anterior clinoid processes, though it had entered at least 10 cm. distant in the upper frontal region. Under the fluoroscope and without an anaesthetic a blunt probe was inserted until it was seen to rest at the foreign body. The magnet was then brought to the probe and the latter extracted. No fragment accompanied it. A second and third trial was made without success, but on the fourth attempt the small bit of iron was withdrawn, adhering to the magnetized probe.

In the other cases a modified decompression operation was performed, the chief object at operation being to remove scattered bony fragments and relieve pressure. All wounds were carefully closed in layers and drained by small pieces of gutta-percha tissue. Constant daily dressings followed and formed a most important part of the treatment, for by this care subsequent infection was obviated and herniae avoided.

The results were as follows. (1) Among the operated cases there were 2 deaths from meningitis, 5 recoveries and return to a practically normal state—these cases may be called cured. The aphasic soldier began to speak 10 days after his operation and in the 4 hemiplegias perfect motor control was regained within 2 to 4 weeks. (2) Of the unoperated cases 5 showed improvement with careful dressings, massage and exercise. In all, 3 were left with a permanent disability; one in which an occipital lobe had been blown out was left with a permanent homonymous hemianopsia; one right parietal injury developed slight Jacksonian attacks, and the last with a bullet wound through the base of the skull developed an extreme ataxia and epileptic seizures at a late period. The two deaths occurred in cases with very extensive brain



FIGS. 4 and 5.—II. 1. Anteroposterior and lateral views of a small shell fragment just above the anterior clinoid processes; opening in skull in upper frontal area; fragment removed by magnet.

lacerations which were badly infected when admitted.

The one case of concussion without bone injury was the only example in our series of psychological shock experienced by some of these men. In its more exaggerated forms they go into a stupor and for days live in a condition of hebetude and katatonia much similar to cases of dementia praecox. These patients are dumb, listless, inactive, apparently seeing and hearing nothing. They appear as automata and will eat if a spoon is placed in their hands, but never speak.

II. *Cerebellar Lesions.* Of these we had 3 cases, one a penetrating, one a perforating wound, the third a tangential groove of the lower occiput. In all 3 cases localizing symptoms were present; ataxia, positive Romberg and muscular weakness, in one nystagmus; headache in every

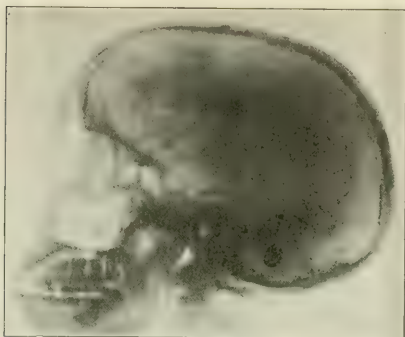


FIG. 6.—R. H. Shrapnel ball in subdural space, occipital 'ossa, left side; successfully removed.

case, and in two a measurable choked-disc. In one case there was a temporary amaurosis due to concussion of the neighboring occipital lobe. Two cases underwent operation. In one a shrapnel ball was removed from the extradural space. In another a perforating wound had occurred in which the bullet must have just missed the sinus, and a great number of fine bony particles were removed from the lacerated cortex and even from the sinus wall. The patient carrying the shrapnel ball (Fig. 6) was interesting in that he seemed perfectly normal except for a small granulating sinus behind his left ear and was about to be discharged. A routine x-ray revealed the missile apparently in the cerebellum. There were no outspoken cerebellar symptoms, though if the head was violently shaken or the patient whirled suddenly a distinct Romberg, vertigo, and slight nystagmus were elicited. All 3 cases made uneventful recoveries except for a temporary cerebrospinal leak in the unoperated case, and they have doubtless long since returned to active service.

III. Spinal Cord Lesions. In this group are 7 cases. Two were complete divisions of the cord by a rifle ball and in all but one there was bony injury. Four cases were classified as hematomyelia, two of these having entered the hospital within 3 days after their injury. In one several shell fragments had lodged in the upper cervical region and a few of the larger pieces had been removed. He was paralyzed and anaesthetic from his neck down, a characteristic hyperaesthetic collar surmounting the anaesthetic field. Another case had been buried up to his neck by a mine explosion. When exhumed he was found paralyzed and anaesthetic from the nipple down on one side and below the umbilicus on the other. Increased reflexes were present in both cases. The latter case with massage and rest improved very rapidly and in two weeks was up walking. The other case improved more slowly, and, as we suspected a broken lamina at least, had to be handled with great care.

With massage and exercise first sensory and then motor return began and a few weeks ago he wrote me that he walked out of the hospital unassisted. A third case had a dislocation crush of his second lumbar vertebra due to caving-in of a trench after a shell explosion. He showed complete paraplegia and sensory loss from his waist down. After 3 months, motor and sensory return were complete except for a residual paralysis of the peroneal group of one leg, where there had been some actual destruction of anterior horn cells. Of course no operative interference should be attempted in any spinal injury where such a condition is suspected.

Of the other spinal injuries there were two with complete division of the cord by a rifle ball. One had suffered with terrific root pain, lancinating and unbearable, for months. The injury was at the second lumbar spine. As an act of mercy the cord was completely divided about one and one-half inches above the lesion with incomplete relief and in all probability a higher section should have been made. In still another case a small piece of shell fragment passed through the left lower jaw fracturing it and cutting the facial artery; continuing, it passed across the neck lodging in the intervertebral disc between the second and third cervical vertebrae. Here it started up a fatal meningitis.

In all, 4 of the 7 cases were operated. Two had laminectomies and 2 local exploration of the wound. In 2 cases a foreign body was recovered. As results 2 died, one from meningitis as mentioned above and one of the complete divisions of the cord succumbed to toxæmia and renal sepsis after some weeks. His spine was crushed in the mid-thoracic region, and for weeks he had suffered from excruciating visceral (abdominal) pains. A sacral decubitus and severe cystitis followed and speeded a long hoped for death and relief. Four cases were greatly improved, all in the hematomyelia group already mentioned.

IV. Sympathetic Nervous System Lesions. There was one case that had had an injury in the neighborhood of the spinal sympathetic nervous system and which showed a small pupil on one side and some peripheral disturbances as sweating and color changes in the skin.

V. Peripheral Nerve Lesions. This comprises a large and varied group containing 39 separate lesions which have been divided as follows:

Musculo-spiral nerve injuries	10
Median	5
Ulnar	3
Facial	4
Brachial plexus	3
External popliteal	5
Internal saphenous	2
Circumflex	1

Patheticus	1
Amputation neuroma	1
Sciatic	1
Crutch paralysis	1
Protopathic disturbance of the hand	2

In 22 of the 39 cases the nerve lesion was the accompaniment of a skeletal injury and in all of the musculo-spiral injuries but one there was a compound fracture of the humerus. We have included sensory as well as motor nerve lesions and we inherited from our predecessors from the Western Reserve University three cases in which sensory nerves had been sutured before our arrival in Paris. The symptoms were the usual ones of motor disability and anaesthesia over distinct areas and they showed the curious formicating sensations, protopathic disturbances and trophic changes that sometimes accompany peripheral nerve lesions. Twelve of the 29 cases were operated upon, as follows:

Musculo-spiral ...	freeing from scar 2; suture 2
Median	freeing from scar 1
Ulnar	suture 1
External popliteal.	suture 2
Internal saphenous	suture 1; freeing 1
Brachial plexus ..	freeing from scar 1
Facial	suture 1

Of the 27 unoperated cases 18 showed rapid improvement and there doubtless was no anatomical gross lesion despite the apparent paralysis. Many have observed the great frequency of paralyses without general anatomical findings and one should be conservative in operating upon such cases and should use electrical stimuli to differentiate true and false lesions. Injuries may so contuse nerves as to cause failure of function.

Except where nerves that were intact were merely freed from scars, the end results on the operated cases cannot of course be foretold. The cases in which a nerve was caught in a scar or callus and freed by operation have already shown marked return (2 musculo-spiral, 1 median, 1 brachial plexus and 1 internal saphenous).

Other than operative treatment we used massage, electricity and various forms of splints to maintain position till function should return, thus hoping to avoid muscular contractures and joint disabilities.

To summarize the total results. Forty-six cases were improved—10 unimproved. These latter were chiefly nerve sutures, the results of which cannot as yet be foretold. Four cases were cured or returned to a practically normal state, and there were in all 4 deaths. The cases were very carefully studied, operations were done under conditions almost as favorable as those in a hospital in times of peace, and the after treatment was followed in great detail.

THE PRESENT STATUS OF GALL STONE DIAGNOSIS BY THE ROENTGEN RAY.*

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Goddard Hospitals.

No longer ago than March, 1913, Mr. Thurston Holland¹ wrote, "A survey of the literature of radiography furnishes very few instances of successful results as far as the accurate detection of gall stones by x-ray is concerned. Here and there a few instances have been reported when shadows have been obtained in suspected cases and where, at the operation which followed, gall stones have been found. It is recognized, however, by all radiographers that in a great number of these cases it is impossible to get any shadow of gall stones on a plate or to see any shadow on the fluorescent screen," while as recently as March, 1915, Cole and George² declare categorically, "it would now appear we can show them (gall stones) in all cases where they are present."

All roentgenologists may hesitate to say that their success in gall stone diagnosis is one hundred per cent. However, it has been borne in upon all of us that, with a proper technic and tireless effort, gall stones can be shown roentgenographically so much more often than formerly that the intimate coöperation of the profession should be solicited for the perfecting of this diagnostic aid.

Nearly all the earlier writers on the subject agree on the impossibility of detecting gall stones by the roentgen rays. Even so remarkable a technician as Albers-Schonberg writes in 1914 that nothing has been achieved of significance in the diagnosis of gall stones by the Roentgen ray.

Only a very few expressed themselves from the start more favorably. Carl Beck of New York showed the first plates of gall stones at a meeting in that city in 1899. He detected two large stones in the gall bladder, three smaller ones in the liver and one in the cystic duct. In several later publications, the latest in Groedel's Atlas (1910), he continued to express himself optimistically without, however, carrying conviction, thinks Panner³, inasmuch as his observations seemed essentially based on the examination of extracted gall stones.

In 1904, Kohler⁴ demonstrated a large gall stone the character of which he substantiated by repeated examinations. Mikulicz⁵ writing in 1905, believed a positive result seldom attainable, but, with wisdom, refused to forecast the future. In the same year Holland⁶ published his first gall stone case, accompanied by illustrations. He found a ring-like shadow in the right upper hypocondrium, but he did not interpret it as gall stones since he had never before seen anything similar. At operation two large gall

* Read before the Brockton Clinical Society, December 7, 1915.

stones were found in a gall bladder empty of fluid. The shadows of the two stones had evidently overlapped in the roentgen examination.

From Königsberg, in 1906, came a lengthy article by Matthias and Fett.⁷ They reported two cases. On the roentgen plate was seen a marbled shadow which in form and position corresponded exactly to an enlarged gall bladder. They thought the shadows were from a bladder filled with stones. In one case this was confirmed at operation. The small stones that were extracted were found to consist largely of calcium carbonate. The other patient was not operated upon.

Gottschalk⁸ published, in 1909, a case that showed three shadows within the liver which he diagnosed as gall stones. The patient did not come to operation. Before the American Roentgen Ray Society of Detroit, 1910, Pfahler⁹ of Philadelphia reported three positive discoveries of gall stones. Haenisch of Hamburg, and Cole who participated in the discussion, each reported three positive diagnoses. De Quervain¹⁰ found in the course of a stomach examination, to the right of the pylorus, a shadow, resembling a cluster of grapes, which he regarded as a group of small gall stones. At operation a number of small stones of irregular form consisting mostly of calcium carbonate was found.

Edling¹¹ brought up the question at the roentgen congress at Berlin in 1912. He reported two positive cases of his own and one from the Kommunehospitalet investigated by Fischer. This last is interesting in several respects. The patient gave a history of colic in the right side, with hematuria, and was referred for examination for kidney stone. In the location of the hilus of the right kidney was seen a homogeneous shadow about the size of a walnut. It was diagnosed as a renal calculus, but none was found at operation. At autopsy, a stone was found in the gall bladder in form and size corresponding to the roentgen picture.

In the plates shown by Edling were seen numerous intermingled ring-like shadows. In the ensuing discussion, Immelmann laid stress upon this ring-like form being the characteristic gall stone shadow and due, he said, to a peripheral layer of lime in the stone. Frankel stated his belief that this lime shell is the condition *sine qua non* for a positive diagnosis of gall stones and that one should guard against such a diagnosis when the shadow is homogeneous.

Holland¹ reported two new cases in 1913, that gave this ring-like shadow. This same roentgen appearance was noted by Jaugeas¹² in his published case.

Lewis Gregory Cole¹³ of New York, May 8, 1913, before the Atlantic Medical Society, reported 20 cases in which he had made a diagnosis of gall stones directly or indirectly. Eleven of these were operated upon and the surgical findings concurred with the roentgen diagnosis. Eight cases in which there was direct evidence of biliary calculi were not operated upon.

James T. Case¹⁴ of Battle Creek, June, 1913, at the annual session of the American Medical Association, stated, "In a thousand patients referred for gastro-intestinal disorders I have demonstrated gall stones by means of roentgenoscopy in almost five per cent. I believe I am safe in the opinion that when gall stones are present they may be demonstrated by this means in 40 to 50 per cent. of cases."

In March, 1914, Pfahler¹⁵ declared, "Both Case and myself believe now that about 50 per cent. of gall stones can be demonstrated but that negative findings never can be interpreted as indicating the absence of gall stones. My records show positive findings in 74 per cent., but I believe in general one cannot count on more than 50 per cent. being demonstrable."

At about the same time, George and Gerber¹⁶ of Boston published an article in which they say, "We believe that gall stones can be demonstrated by the roentgen ray in nearly every case of gall bladder disease of long standing where stones are really present."

H. J. Panzer³ read an admirable paper before the Danish Surgical Society, December 12, 1914, on gall stone diagnosis by the roentgen ray. His review of the European literature on this subject I have availed myself of freely in this paper and gratefully acknowledge my indebtedness. He reports eight positive diagnoses of his own and dwells at length on the ring-like shadow as being the characteristic roentgen picture of gall stone.

"If it can be regarded as settled," he writes, "that in a number of cases we can detect the presence of gall stones by the roentgen examination, it is just as certain that we shall most frequently get negative results of a sort to which there can be given no significance whatever." He feels that only a very small proportion of gall stones will offer favorable conditions for reproduction on the photographic plate, for he says, "Gall stones usually consist to a great extent of so considerable a quantity of organic substance that they cannot be differentiated from the surrounding tissues. To be sure, they nearly always contain inorganic ingredients, namely, lime adhesives, especially pigment lime and, less frequently, carbonic lime, but these are, as a rule, diffused through the whole stone so that their proximity is not capable of altering the conditions."

Cole¹⁷ of New York presented a communication, February, 1915, on "The Detection of Pure Cholesterin Gall Stones by the Roentgen Rays" which changed his thought on the matter of positive diagnosis of such stones. He sought to determine how a variety of gall stones *extra corpus* would appear on the photographic plate when suspended in air, water and bile, as compared with a selected "keystone" fairly rich in calcium content. His results are summed up as follows:

"About 20 per cent. of the gallstones showed more calcium deposit than the keystone. About 26 per cent. showed a trace of calcium less than the keystone. About 54 per cent. showed practically no calcareous deposit, in other words, they were practically pure cholesterol.

"Eighty per cent. of the stones submerged in bile cast a shadow less dense than the bile surrounding them. This observation would seem to preclude the hope of a positive diagnosis of gall stones in more than twenty or twenty-five per cent. of the cases. But the cholesterol stones are so much less dense than the bile surrounding them that they appear like bubbles of air and when many stones are present the bile surrounding them appears more dense than the stones and gives the area of the gall bladder a honey comb appearance or the ring-like shadow typical of gall stones.

"I have made a definite or probable diagnosis of gall stones in thirty cases. In only one case was there the amount of calcareous deposit which six months ago I deemed necessary to justify one in making a safe diagnosis of gall stones. Sixteen out of the thirty cases have been operated upon. Of these sixteen cases, twelve were correctly diagnosed roentgenographically, three incorrectly diagnosed and one very provisional diagnosis was incorrect."

Beck, from the very start, believed such experiments gave the greatest hope for the future of gall stone diagnosis. Pfahler early experimented along this line but abandoned the method. Dodd and Holmes of Boston carried out a series of experiments similar to Cole's which they reported at a meeting of the New England Roentgen Ray Society last winter, from which they concluded that roentgenologists had been looking for positive shadows in their roentgenograms when, as their experiments would indicate, one ought to look for negative shadows, so to speak, at least in the case of stones rich in cholesterol. Atrial George of Boston had in practice anticipated these findings as witnessed by the very remarkable series of gall stone plates exhibited by him at the annual meeting of the American Roentgen Ray Society in Cleveland, 1914. The majority of the plates exhibited by him showed nothing but these so-called negative shadows.

Cole and George² in March, 1915, published a joint paper in which they state, "after having considered that we detected them (gall stones) in fifty per cent. of the cases, it would now appear that we can show them in all cases where they are really present and that a positive diagnosis can be made in such a large percentage of cases where gall stones are present that the negative diagnosis has become far more important than it was previously considered to be."

At the annual meeting of the American Roentgen Ray Society in Atlantic City, September, 1915, George presented "Some Further Notes on the Roentgen Diagnosis of Gall Stones," in

which he insisted that success was only a matter of proper technic. In a series of 54 selected cases reported by him, which were operated upon by eight different surgeons, a positive diagnosis was made in 30 cases and a negative diagnosis was made in 24. There were three errors in positive diagnosis. No case negatively diagnosed was found to have gall stones at operation. The error in diagnosis is thus seen to be less than six per cent. for the series and a ten per cent. error in positive diagnosis. That his negative diagnosis was 100 per cent. correct, is strikingly significant of the recent advance that has been made in the roentgen diagnosis of gall stones.

A variety of technic has been described by as many roentgenologists. This man prefers one method, that another. In reality neither is anti-paethetic to the other.

For preparation I believe catharsis valuable, and prefer an effervescent saline. Catharsis will help rule out food particles which have been mistaken for calculi, and the gas resulting from an effervescent saline, as has already been noted by observers, may very materially improve the definition of calculi. In Fig. 1 is seen a gas-dis-



FIG. 1

tended bowel lying partly over the gall bladder. The stones in that portion of the gall bladder are seen much more defined.

The patient should be fasting. Catharsis by mouth may be aided by an enema so that if artificial gas distention of the stomach or colon be necessary, it can be profitably done. George thinks that a full bowel may at times be an advantage, as when bismuth filled, since it has a tendency to immobilize the gall bladder.

Roentgenoscopy has absolutely no place in the direct diagnosis of gall stones, for reasons which I have shown elsewhere.¹⁸ It may be of value when studying the indirect manifestations of gall bladder disease. Serial plates alone should be employed.

The patient should first be examined prone, the abdomen on the plate with the shoulders slightly raised as suggested by Beck, if the patient be stout, in order to decrease the costo-hepatic angle. Several plates should be taken in this position, then the manoeuvres of Pfahler

and Cole employed, such as bending the body sharply to the left and directing the rays obliquely through the liver using, if one wishes, the 8 by 10 piece of board as described by Pfahler, to bring the gall bladder closer to the plate, or the circular plate holder of Cole which can be pushed up under the gall bladder for the same purpose. My own belief and that of George is that such procedures are seldom necessary.

I use a fast, finely grained intensifying screen in all gall bladder work. It is important that one have a screen of fine grain, otherwise some shadows will be sure to be lost and more than one screen must be used in order to check one's results. The advantage of employing screens is that of time as well as intensification. It is fundamental in this work that the patient should not breathe during the exposure. Stout individuals may find it difficult to hold the breath even for a second, hence the reason for speed. The screen, too, will catch more surely the markings of the so-called soft gall stones. It is again of special value in the robust and corpulent where a long exposure on an unscreened plate would give rise to so much secondary radiation that the gall stone shadows would actually be lost in the fog.

Whether or not one employs one of the standard gas tubes or the Coolidge tube, may be a matter of choice. It is essential that one work with a soft tube that will stand up under repeated charges of heavy voltage such as one would employ when roentgenographing large subjects. Gall stone work is too painstaking for one to have to worry about cranky tubes. I have used two Coolidge tubes now for eight months past with the utmost satisfaction.

The position of the tube will depend upon the position and size of the patient but usually it is in a plane parallel to that of the patient's body. A small diaphragm and a small cone are very important factors aiding one's success in looking for gall stones. The small diaphragm tends to centralize the really important rays of the focal spot, while the cone delimits secondary irradiation.

One objection to the diaphragm and small cone is the fact that one may overlook stones in an abnormally placed gall bladder so that it is well not to confine oneself in one's search for stones to the commonly accepted location for them. They may be found anywhere in the lower or upper right quadrant and even to the left of the median line. A gall bladder lying over the sacrum containing stones was reported by the Mayo Clinic.

The time of exposure will be determined in part by the patient's size but it also may well be a matter of technic. Because of the variety of calculi and their consequent variation in density, it is well to make several roentgenograms that one would ordinarily consider under exposed or over exposed. Stereoroentgenograms, also,

are not without their usefulness and may be requisite to a proper differential diagnosis.

One's success in gall stone diagnosis even may extend to one's method used in the darkroom, as called to our attention by Stewart¹⁰ of New York. A satisfactory developer goes without saying. More than that, one may with advantage overdevelop certain plates while giving others their normal developing time. Plates that are too dense to be read may be reduced and in that way gallstone shadows detected in the process of reduction that would not be likely to be found in any other way.

The interpretation of the roentgenogram calls for the greatest skill and a broad experience. The plates should be read only when thoroughly dry. Direct illumination by the northern sky is often particularly helpful. If stereoroentgenograms have not been made, the superimposition of plates one upon the other, as suggested by Cole, will give a stereo effect and may be of some aid. That experience is a tremendous asset to successful diagnosis is witnessed by the number of roentgenologists who, under the impetus of the recent advances in gall stone diagnosis, have gone back over their old plates of the gastrointestinal tract and gall bladder region in which they have reported no evidence of gall bladder calculi, only to find on restudy very definite evidence.

Interpretation is intimately bound up with differential diagnosis. They both hark back to experience, for other things being equal, the man with the broadest experience ought to be the best diagnostician.

The roentgenographic appearance of gall stones will vary according to the amount of lime salts present. Thurston Holland quotes the late Dr. O. T. Williams as saying, "It is rare to find stones composed of pure cholesterin on the one hand, or of pure pigment salts on the other. The cholesterin stones almost invariably contain some pigments, such as calcium salt, and further, in those I have examined, there has usually been present some calcium carbonate. Nearly all gall stones contain a good deal of cholesterin, and calcium salts of the bile pigments may be said to be invariably present."

The more lime salts present in a calculus, then the more readily it shows up on the roentgenogram. Much has been said about the so-called ring-formed shadow as being characteristic of gall stones. When this peripheral shadow is due to calcium carbonate it usually stands out in relief, the central area varying in density according to the amount of calcium salts present. This is the type of gall stone that is easy to recognize. When the peripheral shadow is due to inspissated bile or bile pigments in which cluster a group of cholesterin stones poor in calcium content, then one must examine the plates minutely for them (See Fig. 2.) This is the type of stone that escaped roentgenologists until



FIG. 2

Arrows point to two gall-stones, the type not easily reproduced. The patient had been operated upon twice within nine years for gall-stones and none found. Following my roentgen diagnosis patient was operated upon by Dr. C. J. Dacey and two stones were found.

George demonstrated them at Cleveland and Cole checked up his work.

This is the type of stone that cannot be reproduced photographically with anything like success and is the type of stone that consultants question because they cannot detect it on the plate.

Dr. E. A. Codman, a Boston surgeon, in his second hospital report, blames three errors in diagnosis to lack of faith in the x-ray. One case in point was a patient operated upon for gall stones after Dr. Arial George had made a definite negative diagnosis. No gall stones were found at operation.

On the other hand, any and every shadow does not mean gall stones. Food remnants, bismuth remains from treatment or residue from a meal, calcified costal cartilages, calcified mesenteric glands, and, chiefly, renal stones, must all be differentiated.

A renal calculus usually gives a homogeneous shadow and in shape often takes on the contour of the kidney pelvis. A simple method of differentiation between biliary and renal calculi is to make plates with the patient prone and supine. If the shadow is more distinct with the patient supine the shadow may be considered a kidney stone, and vice versa a gall stone if the shadow is more distinct with the patient prone. This method is simple but far from exact.

Figure 3 shows a shadow apparently within the gall bladder. This plate was made with the patient prone. The plate, made with the patient supine under exactly the same physical conditions, gave a much less distinct shadow. The patient had been referred for gastric symptoms, there being question of gall stones. With the previous method of differentiation and history one might jump at the diagnosis of gall stones. A lateral view may save the necessity of catheterization of the ureter. If one sees the shadow lying against the vertebrae, then one can be reasonably certain that one is dealing with a kidney

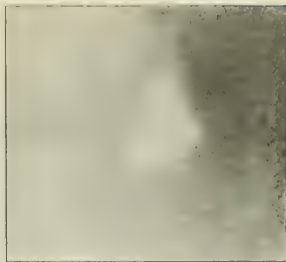


FIG. 3.

stone. The only absolute method of differentiation is by catheterization of the ureter, which was done in the case just referred to and the catheter and stone were seen in apposition. If catheterization were done in the case quoted by Panner above, there would have been no need to make the diagnosis at autopsy.

When no direct evidence of gall stones is found, a negative diagnosis should not be rendered until the indirect evidence of gall bladder disease has been looked for by serial plates and roentgenoscopy. This done, one may with safety make a positive or negative diagnosis of gall stones, and not before.

The errors in hospital diagnosis may be greater than in private work. This is to be expected for one cannot, unless gifted with the tongues of Babel, impress on the foreigner who comes for examination the necessity of holding the breath at the time that you order it done, and even slight movement will preclude many a positive diagnosis of gall stones.

No mention has been made here of my own cases for I cannot but feel that my results have been so far altogether too uniformly good. I do feel very strongly, however, that with our present knowledge, a positive or negative diagnosis of gall stones is dependable.

The proof of the pudding is in the eating. The ideal would be to have a surgeon or group of surgeons submit their cases that are to be operated upon, irrespective of what may be the roentgen findings. In this way we should soon learn whether or not we have in the x-ray an infallible guide—infallible as anything wherein enters the personal equation can be—in gall stone diagnosis.

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BRIDGING A GAP IN OUT-PATIENT SERVICE.*

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THERE are three fundamental factors which enter into the care of all patients whether in private practice or in hospital service: First, the skill of the surgeon or physician; second, the equipment for diagnosis and treatment, and third, the personal relation of the doctor and patient—a relationship which, when rightly comprehended, places the responsibility upon the physician of seeing that his patients understand the treatment required and how it may be obtained. The first two factors have for a long time been carefully considered but until recently the third factor in institutional work has been neglected. In our private practice we are able to personally control our patients and to make them realize the necessity for carrying their treatment to completion. If this is not done we are sure to know it. On the other hand, in a large out-patient department, with its constantly changing corps of attending physicians and the large number of patients treated daily, how many of us know whether the operation we advised has been arranged for or whether the patients we saw last week have returned as many times as they should and will continue to have treatment until they are cured?

In addition to these three factors it is well to remember that a physician's or surgeon's reputation and the good name of the institution with which he is connected are at stake. This has been brought home to me quite forcibly during the past two years. For example, a man came to the Out-Patient Department of the Boston Dispensary with sutures still in his scalp which were surrounded by mild infection. My first impulse was to criticize the institution which sewed up his scalp, but, upon investigation, it was found that necessity of returning for the removal of the sutures had not been clearly explained to him. The second case was that of a young woman who fell and hit her elbow a few hours before coming to the Out-Patient Department. She was examined and a diagnosis of probable fracture of the olecranon was made. After temporary immobilization, she was told she should return the next day for an x-ray examination. Some two weeks later she was seen, and explained that as her arm did not pain her very much she had removed the dressing and resumed work without having an x-ray. Examination was immediately made proving that she did have the fracture suspected but that the loss of time had given her an elbow which then

could not be straightened out and which would mean for her a long course of manipulation and baking. The third case, which represents another class, is a man who came under observation and received an immediate diagnosis of inguinal hernia. He was strongly advised to have an operation and, seeming perfectly willing to do so, was referred to a hospital. Some months later he was brought into one of the large general hospitals with a strangulated hernia.

Cases such as these have made us at the Dispensary feel the necessity of finding out whether these patients represented exceptions or whether they represented the ordinary incompleteness of out-patient treatment. A study this year made of the surgical department showed that 45% of the new patients made but one visit. A few of these cases, of course, did not need to come back, for one visit would give them the opinion they desired, but most of them should have had further treatment or be placed in a general hospital where they could have needed operations. With increased interest we began to study the results of a competent follow-up system in other departments of our own institution and found that it worked an amazing result on the efficiency of those clinics. The following chart shows almost dramatically the result of the follow-up work on the two gaps in out-patient treatment, namely: *insufficient visits and disregarded advice.*

"BEFORE AND AFTER TAKING."

A Follow-Up System.

In Relation to Visits.

MALE G. U. CLINIC.

Per Cent. of Gonorrheal Patients making more than 1 or 2 visits.

1911-12 (before).....	37.6%
1914-15 (after).....	76.5%

MEDICAL CLINIC.

Per Cent. of Patients making more than 1 or 2 visits.

1914 (before).....	51 %
1915 (after).....	94 %

In Relation to Advice.

EYE CLINIC.

Per Cent. of Patients who secured glasses advised

1911-12 (before).....	50 %
1914-15 (after).....	97 %

GYNECOLOGICAL CLINICS.

Per Cent. of patients who secured operation advised

1913 (before).....	7% Secured it
1914 (after).....	95% " "

Briefly, the follow-up system used at the Boston Dispensary may be described as follows: A card ruled in such a way as to give a space for each day of the month is attached to each history card as it is sent with the patient to the doctor. The doctor indicates on that card when he wishes to see the patient again and these cards are filed together under their respective dates. At the end of each morning, it is easy to see what patients who should have come back failed to do so, and they are then written to and advised to

* The substance of this paper was presented by me to some of the surgeons who visited the Boston Dispensary during the recent Clinical Congress of Surgeons. It presents from the viewpoint of a doctor, who runs his own clinic, some of the facts which have been used in previous papers from an executive's standpoint.

return. If they fail to return after receiving written word, their case is brought to the attention of the visiting physician or surgeon, and if he considers it of sufficient importance, a visitor is sent to the patient's home to explain the necessity of further treatment. To demonstrate the success of postal cards alone, 140 of them sent in one clinic brought a return of 128 patients. Of course, no such result could be expected unless the patients were sent for shortly after their first visit.

Some may question whether such a "paternalism" of a clinic may not tend to diminish its size. Fortunately, figures are available in answer to such inquiries. In one of our clinics the number of new patients increased over 200% as a result of the follow-up system. Patients receiving letters or visits seem to feel that real interest is being taken in them as individuals.

In contrast to the three cases just quoted, I wish to detail one more where the follow-up system demonstrated its efficiency. A woman within two weeks of confinement came to the Dispensary with a well marked cancer of the breast. Of course she could not be operated on until after delivery. In the natural course of events she would have been lost sight of, being merely advised to have an operation "as soon as possible." However, she was referred to a social worker who took the responsibility of seeing that the surgeon's advice was carried out and she succeeded in having her operated two weeks after the delivery of her child. This involved following the woman to one of the small towns outside of Boston and arranging for the care of her family during her absence from home, which probably would not have been possible without outside help. This patient was kept track of for two years after her operation, being seen at intervals at the Dispensary by the doctor who first made an examination and advised operation. With a properly installed follow-up system, such completion of work would not be the exception but the rule.

Clinical Department.

CONGENITAL ELEVATION OF THE SCAPULA. A NEW OPERATION? CUBITUS VARUS. REPORT OF A CASE.

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CONGENITAL ELEVATION OF THE SCAPULA.

THIS deformity has been written about by numerous authors, and the published results are not very encouraging. In some of the reported cases, there is mentioned a definite bridge of

bone or fibrous tissue which anchors the scapula to the spine. Different writers recommend the removal of this bridge, and also a division of any muscles which tend to elevate the scapula, *i.e.* levator anguli scapulae and the rhomboids. Other writers advise that when there is no anchoring bridge to be removed, it is better that no operation be performed. With such difficulties and such an outlook as above described, when a concrete case presented, the question to be answered was, Is it worth while to operate?

No bony or fibrous bridge could be made out by examination and none was found at operation. A careful study of the shape of the scapula and of the anatomy involved led me to think that a solution of the difficulty was possible. In these elevated scapulae, the upper edge seems to be curved forward, making a rounded appearance over the top of the shoulder. It seemed probable that the levator anguli scapulae, although it held up the scapula, might easily allow of some motion backward and downward, if a strong pull should be made in this direction. Then looking at the diagonal position of the rhomboid muscles, it seemed fair to suppose that, if the scapula could be moved toward the spine and downward, its inferior angle must be pulled towards the spinous processes, and, instead of projecting prominently outward, it would then be drawn closer to the chest wall and become less prominent.

The case in question was that of a girl six years, four months old. Operation was done in July, 1915. A vertical incision was made between the posterior border of the scapula and the spinous processes. The trapezius was divided at the base of the spine of the scapula, and a V-shaped wedge of muscle removed. (See Fig. 1. C.D.) A suture was then taken through all of the tissues, sending the needle close to the bone, at the inferior angle (illustrated on the opposite side by B. Fig. 1), and passing it, also close to the bone, through all tissues anywhere in the region of the tenth, eleventh, or twelfth spinous process as the fixed point. (A. Fig. 1.) Forty-day chromic gut was used, and as this suture was drawn taut, the inferior angle (B. Fig. 1) was drawn towards the fixed point A and the whole scapula was drawn downward and toward the spine. Then the edges of the V excision in the trapezius were approximated, bringing D down to C, and sutured with chromic gut, hoping that the trapezius thus shortened would continue to hold the scapula downward and in place after all sutures had been absorbed. (Both sides of the picture were used for illustration, but, of course, the whole operation was on one side only.)

How well this was accomplished may be seen in the photograph (Fig. 2), taken in November, 1915. The inferior angle is not so low as on the normal side, but it is quite some shorter than its mate by actual measurement, so that the angles ought not to be level, anyway. It will be observed that the contour of the shoulder and neck is very nearly normal and that the arm can be elevated, as shown in the photograph. Although I did not exhaust the literature I saw no mention of such an operation as above described.

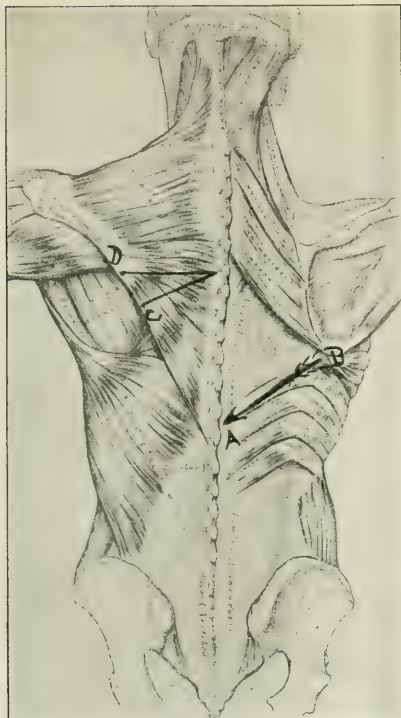


FIG. 1. Showing the excision of the V-shaped wedge C D, and the direction in which the scapula is pulled from B towards A.

CUBITUS VARUS.

Cubitus varus, or the so-called gun stock deformity, follows a fracture of the lower end of the humerus when the short fragment has not been held in a true alignment with the long fragment. In such a fracture, it might be considered for the time being that the forearm extends, not



FIG. 3. Showing method of strapping hand to prevent rotation.

to the elbow joint, but to the point of fracture, because any movement of the arm is from this point as an entity. Since such fractures have been treated by holding in acute flexion, there is one movement of the arm which, if allowed to take place, may result in this deformity. The arm, by its own weight, tends to sag downward and inward and, quite naturally, the hand and

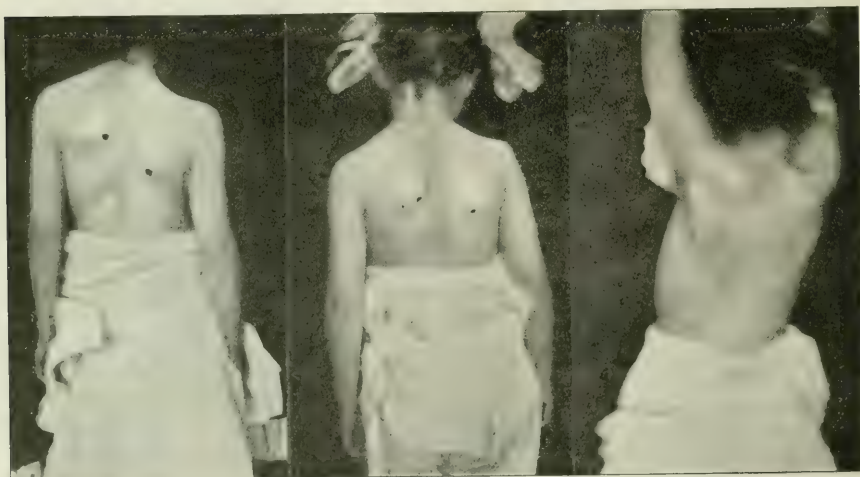


FIG. 2. Showing the contour of shoulder and neck before and after operation, as well as the ability to elevate the arm above the head.



FIG. 4. Showing the arm before and after operation.

arm rotate inward and, as stated above, this rotation takes place at the point of fracture. This position may be corrected by passing a broad piece of adhesive around the hand, extending about four or five inches beyond, where another piece of adhesive, being reversed, is made to overlap the first piece and then passed along the

back, thus holding the hand and arm, and preventing rotation. (Fig. 3.)

I wish to report a case of cubitus varus in a girl ten years of age. She fell from the cradle when a baby, striking the left elbow, and ever since has had a gun-stock deformity. For some time previous to her consulting me, the fingers had been tender and numb, and she would often drop things from her hand. There had also been pain and tenderness in the elbow, so that it had been considered suspicious of tuberculosis.

An osteotomy just above the external condyle was done April 14, 1913, and with the restoration of the proper carrying angle, the symptoms in elbow and hand completely disappeared. Fig. 4 shows the arm before and after the operation.

Therapeutic and Preventive Medicine.

OBSERVATIONS ON THE DIAGNOSIS AND TREATMENT OF DIABETES.*

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CONCERNING the diagnosis and treatment of this malady, I have nothing original to offer, but will present a few facts gleaned from various sources. All authorities are agreed that the condition of diabetes mellitus is increasing; that it is a disease largely, but not exclusively, of the well-to-do. The malady occurs at all ages and in both sexes. Heredity plays a large part, and is traceable in at least 20%. Observers are agreed that functional or organic disturbances of the pancreas are the main causative factors. Experimental observation upon dogs shows that complete extirpation of this organ is invariably followed by diabetes. The conclusion is drawn that the pancreas supplies an internal secretion essential to carbohydrate metabolism. Evidence has been accumulated which shows that other organs besides the pancreas exert an influence upon this process. Disturbances of the thyroid gland, parathyroid and suprarenal capsules are many times associated with glycosuria.

Normal sugar is present in the blood from 0.05% to 0.12%. In diabetes the amount varies from 0.16 to 1.16%. The kidneys are able to hold back sugar when it is present in normal quantity, but when the sugar concentration is increased, the kidneys are no longer able to hold the sugar back. Why does sugar accumulate in the blood? Two theories suggest themselves; one, that the diabetic cannot oxidize sugar; the other, that too much sugar is made. Normally, sugar is derived from carbohydrates, which make a very large amount of our food. That sugar may be formed from proteins has been demonstrated by many experiments.

Transient glycosuria, besides being caused by diabetic tendency, may be due to injuries, to feb-

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rile infectious diseases, to certain poisons, and to the excessive intake of sugar. In my own personal observation, I have met with several cases of transient glycosuria, due, undoubtedly, to the excessive use of sugar. In these instances, a proper regulation of diet in a short time rendered the patient sugar-free.

The symptoms associated with diabetes are familiar to you all. The diagnosis is established when repeated examinations of urine show the presence of sugar. Generally speaking, we become suspicious that a person may be suffering from glycosuria when he complains of excessive and frequent urination, unnatural thirst, pruritis, vague affections of the nervous system, and digestive disturbances which are not otherwise explained. The presence of boils and furuncles are always suggestive of diabetic conditions. It is a well established fact that all patients suffering from this disease have a marked lessened resistance, and the presence of sugar in the blood renders them especially prone to all kinds of infections.

The ideal treatment for any disease is the removal of the cause. In diabetes this is not possible, for the cause is unknown. The condition should not be treated in a routine manner; cases differ and must be treated individually. In no disease is the patient to be warned more against quackery and quack remedies, for the harm of improper treatment cannot be well retrieved. Diabetes is a disease against which the plan of battle cannot be laid for a month or a year, but for a decade, or possibly a lifetime.

Having determined that the patient has diabetes, after several urinary examinations, the next question to be considered is whether the case is mild, moderately mild, or severe. In mild cases, glycosuria disappears from the urine as soon as carbohydrates are eliminated from the diet. It is moderately severe when the sugar disappears upon restriction of the diet, but reappears when carbohydrates in minimum quantities are added. It is severe when sugar cannot be removed from the urine by eliminating all carbohydrates from the diet and restricting the intake of protein food. The essential point of the dietetic treatment consists in bearing in mind the impaired tolerance of the diabetic for carbohydrates by not overtaxing this tolerance. The power of assimilation for carbohydrates is not only conserved in the majority of cases, but increased.

Defective non-combustion or oxidation of carbohydrates, as well as of proteids, in diabetes brings about a condition known as acidosis, due to the presence of beta-oxybutyric acid, which accumulates in the blood, and together with its derivatives, acetone and diacetic acid, is eliminated in the urine. Acetone is also eliminated in the breath. When this condition is present, the patient is liable to develop diabetic coma. This coma is usually preceded by premonitory symptoms, such as restlessness, irritability, dizziness, pain in the limbs, headache and drowsiness.

The treatment of acidosis will depend largely on the previous history of the case. If the patient has been under competent observation, and has developed ketonuria on a strict diet, largely of proteids, he needs carbohydrates. Sodium carbonate should be given in large doses, frequently repeated until careful urinary tests show freedom from this condition. The treatment of diabetic coma must be prompt, energetic and intelligent. Free bleeding is oftentimes advisable, free elimination from the bowels with bitter salines, and the introduction into the blood, by every way possible, of alkalies.

The tendency of all diabetes to become infected with various maladies calls frequently for surgical intervention. No diabetic is considered a good surgical risk. In every case requiring surgical intervention, preliminary treatment, if possible, should be instigated. The urine should be made sugar-free, and the condition of acidosis eliminated; strictest aseptic precautions should be used. It is well to administer alkalies before an operation, whether diacetic acid is or is not present in the urine. The fear of operation upon diabetics has, in a great measure, subsided, and no up-to-date surgeon hesitates to resort to surgical methods of treatment in any diabetic case, when indicated.

My experience in the use of drugs or special remedies, with the exception of one preparation, is unsatisfactory. The continued and intelligent use of trypsin in certain selected cases of a pancreatic type seems to have a beneficial influence. The small quantity of gold and arsenic act as a good tonic for the anemic condition, and the pancreatic ferments, theoretically at least, supply the needed defects, and materially aid in the digestion of carbohydrates.

CASE REPORTS.

CASE 1. Mrs. J. C., married, age 62 years. Under observation past 10 years. Passing large quantities of sugar in urine when first came under my observation. Diet restricted. Trypsin administered. Gradual improvement. At no time has sugar been absent from urine, but greatly lessened. Has not taken tablets for about 5 years, but keeps in fairly good health by restricted diet.

CASE 2. Mrs. S. W., married, age 60 years. Under observation past five years. Passing continuously large quantities of sugar in urine. Restricted diet; use of trypsin. Still using tablets, and finds that condition becomes much worse if omitted.

CASE 3. Mr. C., widower, about 50 years of age. Under observation 3 years. Sugar continuously present in large quantities. Unable to restrict diet to any degree. Takes trypsin tablets faithfully. Urine sugar-free at end of two years. Discontinued tablets, sugar returned. Sugar-free when resumed tablets. General health first class, but gradual loss in weight.

CASE 4. Master L. S., 10 years of age. Under observation one year. Acute manifestation, no apparent cause. Attempted to restrict diet and

placed on tryptogen tablets. No improvement. Referred to Dr. Joslin of Boston. Placed in Deaconess Hospital and Allen treatment administered. Became sugar-free in about one week. Allowed to return home in six weeks. Remained sugar-free when instructions were carefully followed. Sugar present at repeated examinations during past three months, at times. Sugar present in small quantities at present time in spite of starvation treatment one day a week, and restricted 5% diet. Outlook unsatisfactory.

CASE 5. Mrs. R., age 58 years. Sugar present continuously in large quantities. Treatment—restricted diet, use of tryptogen tablets. Material improvement, but at no time sugar-free. General health at present time much improved over that of two years ago.

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THIRTEENTH RUSH SOCIETY LECTURE.*

(ABSTRACT)

Investigative and Scientific Phases of the Diabetic Question With Their Probable Relations to Practical Problems of Clinical Medicine, by Dr. Frederick M. Allen of the Rockefeller Institute for Medical Research.

Dr. Allen emphasized the necessity of keeping in mind the distinction between glycosuria and diabetes. The one was a symptom; the other a disease. One was glucose in the urine; the other a defect in metabolism. Defining diabetes, the author recognized the increasing agreement on the part of investigators that diabetes was deficiency of the internal secretion of the pancreas. This doctrine, it was said, went back to early observations of gross changes in a few cases of clinical diabetes, finally followed by Von Mering and Minkowski's production of acute diabetes by total pancreatectomy. Sandmeyer, by means of atrophy of a pancreatic remnant, produced a type of chronic diabetes comparable to the unusual human cases due to atrophy of the pancreas. A more accurate reproduction of human diabetes was afforded by removal of most of the pancreas, leaving the remnant with its normal blood supply and duct communication with the bowel. De Renzi and Reale first reported such an experiment in 1892. This form of diabetes was later rediscovered independently in four different places about the same time. The first in point of publication were Thiroloix and Jacob, who observed that when a sufficient portion of a dog's pancreas was removed, leaving the remainder in its normal connection with duct and blood vessels, this remnant retained its normal appearance and supplied enough pancreatic juice to maintain the animal's nutrition, yet diabetes developed and ran a gradual downward course much like the human disease. Their second important observation was that in suitably prepared animals this downward progress could be produced or hastened by over-feeding with carbohydrate. The second in point of publication was Helly, who studied only the glycogen, finding that in this form of diabetes the animals retain more or less glycogen, here resembling human diabetes. The third was the work of Allen, which dealt with various points concerning this type of diabetes, compared it with the normal and with other forms of diabetes and glycosuria, and also, thanks to the cooperation of Professor F. B. Mallory, described, for the first time, the specific

changes in the islands of Langerhans in experimental diabetes. The fourth in point of publication was Homans, who discovered this form of diabetes in cats, and made the most accurate microscopic studies.

By this method, human diabetes, Dr. Allen stated, could be imitated in animals in the following particulars: (1) Mode of onset, sudden or gradual; (2) the influence of diet; (3) some individual idiosyncrasies; (4) the diminished permeability of the kidney for sugar; (5) the effect of nervous influences; (6) the effect of traumatism; (7) a temporary stage during which there was glycosuria with little or no polyuria, thus resembling diabetes decipiens; (8) complications in the cachectic stages, generally not identical with the human complications, but rather an increased tendency to corresponding canine afflictions. There was no evidence that complications were due to increased blood-sugar.

The chief points of alleged difference between clinical and experimental diabetes, it was pointed out, had been the following: (1) The dextrose-nitrogen ratio, which is Lusk's figure of 3.65 in the severest human diabetes, whereas removal of the dog's entire pancreas gave only the Minkowski ratio of 2.8. Total pancreatectomy in the human subject, he said, should theoretically give a 3.65 ratio. It was well known, he observed, that phloridzin gave a 3.65 ratio in some species, and a 2.8 ratio in others; likewise the difference of species might explain the different ratios in diabetes. (2) The marked increase of metabolism in totally depancreatized dogs. To the author it seemed probable that partly depancreatized dogs with severe diabetes would not show such a great increase; it was now known that some severe human diabetics showed an increase of metabolism. (3) Anatomical changes in the diabetic pancreas. Weichselbaum had described so-called hydropic degeneration and other lesions in a series of 186 diabetic autopsies. Other investigators had not been convinced of the existence of any specific alterations in the diabetic pancreas. It was obvious that such advanced and generalized changes as were found in the pancreas in experimental diabetes were seldom, if ever, present in human cases, because they were too obvious to be missed. The classical work in the microscopic study of experimental diabetes was that of Homans. Using the Lane-Bensley technic, Homans proved that only the Beta cells showed the exhaustion and degeneration, while the Alpha cells remained intact. Homans had found some similar changes in at least a portion of the islands in human diabetes, and it would seem that the most promising prospect for the microscopic investigation lay in this direction. The functional element in human diabetes was also to be considered which, it was said, was emphasized by the results of treatment. The rapid clinical changes possible in human diabetes seemed to the author to indicate functional rather than organic alterations in the pancreas. Back of human diabetes might be, perhaps, a disorder of the abdominal nerves, possibly disturbing not only the function of the pancreas, but to some extent that of other organs. Though the kidneys were generally normal microscopically in diabetes, functional changes were frequent. Further study of the pancreas obtained quickly after death and fixed and stained by the best methods was regarded as important for deciding this question, and physicians who could obtain such material would render a service by sending for study. (4) A fourth difference was that found in ketonuria or acidosis. It was an old statement that the diabetic patient died in coma and the diabetic animal in cachexia; but by stopping the over-feeding of diabetic patients coma might be less frequent. Also, under suitable conditions, diabetic animals seemed to be subject to this intoxication. The present status of the theories of ketonuria or acidosis were discussed. The fact that severe diabetics were cleared up in these respects by fasting, whereas normal persons or milder diabetics developed ketonuria

* Delivered in Thomson Hall of the College of Physicians of Philadelphia, Jan. 21, 1916, at 8:30 P.M.

on fasting, along with various other experimental and clinical observations, threw the existing theories into considerable confusion. Ketonuria and acidosis seemed to the author to be not explainable by mere lack of carbohydrate, or even by habituation or individual idiosyncrasy. The fundamental nature of the process was in doubt. Diabetes, Dr. Allen stated, might probably be defined as a specific deficiency of the power of assimilating food. The accumulation of reserves, as when the body gained weight, diminished tolerance and aggravated diabetes, whereas the reducing of the reserve stores by low diet or by exercise increased tolerance and checked diabetes. Also one kind of food lowered the tolerance for another kind of food, as adding carbohydrate to a diabetic diet might give rise to ketonuria, and adding fat to a diabetic diet might give rise to glycosuria. The history of diabetic therapy consisted essentially in an interweaving or alternation of two principles: (1) The restriction of the sugar-yielding elements of the diet, namely carbohydrate and protein; (2) diminution of the total caloric value of the diet. The fasting treatment was in harmony with the observed benefits of these methods in the past. This had been previously outlined and details were to be published in monograph form. The principle underlying it was a well-established one in all therapeutics,—rest of a weakened function. No positive means of strengthening this function aside from rest has yet been discovered.

Medical Progress.

PROGRESS IN GYNECOLOGY.

By STEPHEN RUSHMORE, M.D., BOSTON.

(Concluded from page 282.)

OPERATION FOR PROLAPSE OF THE UTERUS.

Mayo²³ discusses several forms of operation for prolapse of the uterus with associated pelvic relaxation. He advocates interposition of the uterus for cystocele with the first or second degrees of descensus of the uterus, but rejects it for the third and fourth degrees. For certain conditions after fifty, in which there is considerable protrusion after hysterectomy, a complete obliteration of the vagina has proved adequate and satisfactory.

If, with considerable prolapse, the bladder is not extensively torn from its uterine supports, with resulting cystocele, some modification of the Kocher operation is to be recommended. In these cases the chief object to be attained is to fix the uterus permanently. Sutures as ordinarily placed, tend to cut out in time and the uterus tends to come down. This has occurred in a sufficient number of cases to need special means for its prevention.

The operation of Mayo is based on Murphy's modification of Kocher's abdominal hysteropexy—splitting the uterus in the median line from the fundus to the internal os, and excising the endometrium. Each lateral flap of uterine wall is then turned outward from the median line and sutured between the rectus and its anterior sheath by chromic catgut and silk sutures. It is

the placing of the uterine tissue beneath the fascia, which, according to Mayo, gives a better closure than the Murphy modification. The closure is in the usual manner.

In the cases where there is considerable cystocele, the uterine supports being also much relaxed and the uterus itself small, better opportunity for plastic support of the pelvic structure is given if the uterus is removed. The recommended incision appears as an inverted V on the anterior vaginal wall, the apex near the external urethral meatus, and the arms of the V being extended laterally and posteriorly to encircle the cervix and meet in the median line posteriorly. After opening the peritoneal cavity and delivering the fundus anteriorly, the broad ligaments are clamped with heavy straight clamps from above downward, two on each side. The incisions laterally to remove the uterus vary in their position according to the relaxation of the tissues. If not much relaxation is present, they may be made so as to leave in a slice of the uterine wall on each side. If there is considerable relaxation, part of each broad ligament may be removed with the uterus. Suturing, with continuous mattress of chromic catgut, begins posteriorly at the tips of the second clamps, which are rolled out so as to approximate the peritoneal surfaces and give no raw area in the peritoneal cavity. The suture passes back and forth behind the forceps, completely through the ligaments, tightening them. When the round ligament is reached, it is caught into the angle of dissection, where the bladder wall has been separated from the anterior wall of the vagina. "The suturing extends backwards on each side from this point, catching into the broad ligaments and then on each side into the angle of the depth of the dissection, thus compelling the bladder to rest on the broad ligaments." This is the essential step in the cure of cystocele. The rest of the closure is by running suture, the mucous membrane being approximated by submucous catgut. Perineal restoration completes the operation.

INVERSION OF THE UTERUS.

Roberts²⁴ presents an interesting and somewhat comprehensive account of inversion of the uterus, including historical notes, and a description of two cases seen by himself. Of these cases, one was relieved by taxis, a procedure recommended by Hippocrates; and the second cured by operation, the treatment recommended by Themison and Soranus. He gives references to the exhaustive studies of Crosse, Thorn and others, and has contributed a very readable paper.

Buck²⁵ reports two cases of inversion of the uterus on which he operated and notes briefly the technic employed. The anterior wall of the uterus was split from vagina to fundus. This free incision does not materially increase the loss of blood and facilitates eversion. He did

not find it necessary to resect the uterine wall to give accurate approximation, nor did he employ the transverse incision recommended by Kehrer. The transverse incision gives an additional resource in a difficult case.

Inversion of the uterus is becoming more infrequent through improvement in the obstetric art, yet occasionally the uterus will invert after childbirth without any manipulative interference on the part of the attendant. Buck's cases are interesting because subsequent to operation, one gave birth to four children and the other to two.

AMENORRHEA.

Kosminski²⁶ has briefly reviewed the literature regarding experimental work on the relations of the hypophysis to the genital glands. He also makes a clinical report on twenty cases of amenorrhea which he has treated by hypodermic injections of pituitrin or hypophysin. He has seen no bad effects, and a sufficient number of cases have been cured or improved to make the treatment worth trying, though, as he says, not all cases of amenorrhea without obvious cause are due to defective secretion of the hypophysis. In the present state of our ignorance, the injection should be tried, as it seems to do no harm and may do some good.

In the therapy of amenorrhea without obvious cause, that is, without mechanical obstruction, chlorosis, profound anemia or other constitutional disease, the so-called idiopathic amenorrhea, which perhaps rests on a functional disturbance of the uterus or of the ovary, or of both, Rieck²⁷ has found the intrauterine plug most useful. The particular form of instrument which he uses as being the most satisfactory he found on the market, invented and put on sale "for preventing conception." It can be easily introduced, and in his series of nineteen cases, over a number of years, has given excellent results. Most of these patients had been subjected to other forms of treatment without avail. The plug is left in for several months, and is retained in place by the constriction of the internal os, which contracts below a small knob at the upper end of the plug. The prejudice against the plug Rieck attributes to the defective mechanical construction of the old forms.

In some cases the plug happened to stay in for several years; in one eight years, then it was spontaneously expelled at miscarriage. Rarely do they give symptoms, but in one case it had to be removed. In a few cases there was complete failure, but in these the plug was apparently left in too short a time. In one patient the plug was removed after seven months of amenorrhea, which has remained permanent. The indications for the use of the plug are amenorrhea or "oligorrhea" of months or years' duration.

INTRAUTERINE STEM DANGERS.

The use of the intrauterine stem pessary for the treatment of dysmenorrhea and sterility is

increasing of late, according to Nicholson.²⁸ Soon after the introduction of this device it encountered considerable opposition, which has recently diminished. Some operators regard it as perfectly safe, others as requiring great care in its employment, while others still regard it as "unsurgical" and to be avoided unconditionally. Nicholson, whose advocacy of the stem pessary dates back only a few years, reports a case of severe pelvic infection ensuing three weeks after the introduction of a plug in a patient in whom no other source of infection could be found. Ultimately an abdominal operation had to be undertaken with removal of one tube and ovary and resection of the other. While the infection could not be proved to be due to the plug, the absence of any previous symptoms on the part of the patient and entire freedom of infection of the husband, as shown by two examinations, makes this explanation seem the most probable to Nicholson. This case calls attention to something with which every operator is familiar, that even a slight and seemingly safe operation may be followed by unexpected and serious results.

ATROPIN AND DYSMENORRHEA.

Novak,²⁹ following the suggestion of Drenkhahn, exhibited atropin in cases of spasmodic dysmenorrhea in young women with gratifying results. In such cases he makes no pelvic examination (generally there is nothing to be made out), but begins the administration of the drug two days before menstruation is expected to appear and continuing for two or three days, according to the usual duration of the pain, one one-hundredth of a grain three times a day. If pain appears, the dose is increased unless signs of atropin saturation are present. The dryness of the throat and the itching of the skin are usually easily tolerated. In some cases he has employed other drugs also, as aspirin.

Another drug which gives relief to some cases of dysmenorrhea is citric acid. Given in the form of sodium citrate three times a day, it is claimed to reduce the viscosity of the blood, and thus alleviate the pain of expulsion. Spitzig³⁰ has found that the nausea, dizziness, headache and mental irritability are vastly improved, and that clots and membranes (sic) are reduced.

MENORRHAGIA.

Jacoby³¹ uses pituitrin to stop uterine bleeding, employing extract of the hypophysis in doses of one cubic centimeter every two days. The results were uniformly successful in fifteen cases. Occasionally disagreeable symptoms appeared, as nausea, and cramps in the abdomen. The treatment was purely symptomatic, and among the conditions in which it was used were threatened abortion, retroversion, disease of the adnexa and parametritis.

In the treatment of the group of cases in which there is more or less profuse bleeding at the time of the menopause, without obvious

cause, Gerstenberg³² has employed undiluted formalin, forty per cent. formaldehyde. The technic is simple: cotton is wound on a Playfair sound and dipped into the solution for ten minutes. Two sounds are used for fifty seconds each. Bimanual examination is made two days before the passage of the sounds. There is no preliminary sponging of the cervix or of the uterine cavity, though the vaginal vault, and the vaginal portion of the cervix may be carefully dried with a sponge. Following the application the excess of formalin is carefully removed from the vaginal vault, and a tampon is laid in the vagina for from three to twelve hours. Douches are given after two days. The patient should be kept as quiet as possible, with cold applications over the lower abdomen. The application will cause uterine contractions, before which the sound must be withdrawn. The second sound is introduced when the patient says the "drawing" feeling has passed off. If two applications do not check the bleeding, Gerstenberg believes that some cause is present which demands other treatment, some form of operation. He has seen no bad results, and many beneficial, and thinks it an excellent substitute for the expensive x-rays.

CHEMISTRY AND PHARMACOLOGY OF THE UTERUS.

Ascheim³³ criticizes the views of those who regard the uterus as having an internal secretion, not on theoretical grounds, but because there is no evidence, he thinks, to support such a view. The analogy between decidua and corpus luteum fails morphologically and histologically. Experimental injection of decidual tissue is inconclusive because there is no way of telling just what is in the injected material,—it may be organic extracts or decomposition products of albuminous substances as far as we can tell.

But in regard to the external secretion of the uterus, Ascheim has confirmed the finding of a lipid substance in the glands, and glandular epithelium in the premenstrual and menstrual stages, and in the early months of pregnancy. In the postmenstruum and the interval, this is a rare finding. Thus the occurrence is similar to the finding of glycogen in the uterine glands and epithelium. But the stroma cells contain lipid substance as well as glycogen, especially in the decidua of pregnancy. The significance of this finding is not clear as yet.

Ascheim³⁴ has also made a study of the glycogen content of the uterus. It is well known that glycogen abounds in the body. Discovered in the liver by Claude-Bernard, it appears constantly in striped muscle and surface epithelium. Its presence in glandular epithelium, adrenals, smooth muscle, pancreas and serous epithelium is not constant. Langhans noted its presence in the epithelium of the mucosa of the body of the uterus, in the decidua and in the cells of Langhans of the chorionic villi. These are normal findings. Driessen, who observed glycogen in "glandular endometritis," regarded

it first as pathological, but later held it to be normal. But it is not a constant finding in the uterus, according to Ascheim, for in children it was not present (autopsy material only) nor in women past the menopause.

In women of sexual maturity, Ascheim found that in the postmenstruum there was no glycogen except in glands which retained the premenstrual type. In the early part of the interval phase, when no secretion occurs, no glycogen was found. Later, as secretion begins, glycogen appears in the glandular epithelium as well as in the enlarging stroma cells. In the premenstrual stage, glycogen is abundant and easily recognized, chiefly in the more superficial portion of the endometrium, especially the epithelium, while in small quantities glycogen is found deep in the stroma as well as in the muscle. During menstruation, the glycogen content varies with the character of the glands: it is present in the glands of the premenstrual type, but absent elsewhere. If a pregnancy ensues, the glycogen becomes much more abundant.

It may be concluded that the formation of glycogen in the uterine mucous membrane is physiological, and is in some way connected with the anatomical changes in that organ. Absent in the first half of the interval stage, it increases in the premenstruum, and especially if pregnancy ensues it is abundant. It may, therefore, be suggested that the endometrium acts as a glycogen depot for the benefit of the embryo. This is but an additional element in the preparation of the endometrium for pregnancy, which by many is now regarded as an explanation of the premenstruum.

It has been suggested that in the absence of the normal glycogen content of the endometrium is to be found the cause of certain cases of sterility. As yet this has not been satisfactorily tested.

Lieb³⁵ has investigated the contraction of uterine muscle, using isolated strips of tissue cut from the outer and from the inner layer of the uterine wall, and comparing it with muscle of the wall of the tube. If such a strip of muscle, cut parallel with the direction of the fibers, is suspended in isotonic oxygenated Ringer's solution and its movements graphically recorded, two types of change may be noticed, corresponding to irregular variations in tonus and to rhythmic contractions, from ten to sixty per hour. The contractions of the non-pregnant uterus are slow but powerful, sometimes lasting for a considerable period, sometimes followed promptly by relaxation. In the tube, the muscle contracts much more frequently,—one hundred to two hundred per hour. The waves are small and may be quite regular in height and duration; in pregnancy the tubal contractions are slower and much stronger.

To what these movements are due is not quite clear, but since they appear in isolated tissue they cannot be due entirely to impulses arising

in the central nervous system nor in the nerve plexuses in the pelvis. That they are not completely independent of the central nervous system is indicated by the clinical fact that a psychic shock may lead to the onset of labor. Originating, then, in the organ itself, they may be due to an inherent rhythmic function of the muscle cells, or to impulses arising in the nerve cells of the tube and uterus. The absence of a well defined plexus, as that of Auerbach in the intestine, suggests the former source. It is possible that the contraction wave, starting in the tube, sweeps over the uterus in a manner similar to the cardiac contraction.

Having established this much, then, of the physiology of uterine muscle, the way is open for drug experimentation. It is found that epinephrin causes marked contraction of the parturient muscle, a point abundantly attested by the work of other investigators. But as epinephrin apparently produces sympathetic stimulation, it was not clear whether this sympathetic stimulation would be motor or inhibitory, as the effect varies in cats, for instance, with the functional condition. In these animals the non-pregnant organ is inhibited by epinephrin, the pregnant uterus is thrown into increased muscular activity. In the human, both in the non-pregnant and the parturient condition, epinephrin causes active contractions. Clinically, its use would be limited to checking post-partum hemorrhages either by douches or injecting into the uterus itself.

Ergotoxin markedly increases the muscle tonus, tending to give a tetanus, but in relative quantities which would be unsafe clinically. Other constituents of ergot were tested, as well as the fluid extract itself.

The experiments with pituitrin bear out in part the facts established by clinical observation. In the pregnant uterus there is increase of tonus and increase in the rate of contraction, but not much increase in force. Tetanus occurs only with very large doses. If the muscle is from a non-pregnant uterus, there is no effect, or there is a diminution of contraction, that is, a depression occurs. The explanation of this is not yet forthcoming. The analogy of the effect of epinephrin on the uterine muscle in cats at once suggests itself, but epinephrin has the same stimulating effects on pregnant and non-pregnant human muscle. It has been suggested that the uterus is sensitized during labor, but of this nothing is actually known.

BLOOD EXAMINATION.

Opinion is still divided as to the best treatment of the puerperal uterus containing retained products of conception. The finger, if it can be introduced into the uterus, has been pretty generally preferred to the curet, as it seems likely to do less harm, and if infection is present less likely to cause a spread of the infection by opening up new channels of entrance

for the bacteria. Theodor,³⁶ basing his conclusions on bacteriological examination of the circulating blood after emptying the uterus for continued bleeding, regards the finger as more dangerous than the curet. He found bacteremia in about fifteen per cent. of the cases after curettage and in seventy-seven per cent. of the cases after the finger was employed. According to his view, the finger presses the bacteria into the tissues and the blood stream. Confirmation of these findings is awaited with interest.

The changes in the circulating blood that take place during menstruation have been studied by a number of observers, but it cannot be said that their conclusions agree. Some of the periods of observation were obviously too short, and in other cases incompleteness from various causes vitiates the conclusions. Gumplich³⁷ studied five normal individuals for a period of five or six months, making observations with sufficient frequency to give the desired accuracy,—from two to four observations during menstruation and from five to seven during the intermenstruum. The hemoglobin percentage and the number of red and white corpuscles, as well as differential counts of the leucocytes were noted. The external surroundings were uniform so far as they could be controlled. The careful technic is fully described.

It was found that the hemoglobin showed only slight variations, about five per cent., and that no relation to menstruation could be made out. The erythrocytes showed variations of several hundred thousand, rarely a million, but these variations followed no rule, and during menstruation in one individual there was sometimes a rise and sometimes a fall. Gumplich, therefore, rejects Poelzl's theory of a typical premenstrual rise. The variation of leucocytes also follows no rule; sometimes a rise and sometimes a fall during menstruation was observed. The variations in differential count, while they are present, show no regularity in recurrence and no relation to menstruation.

Gumplich believes, then, that though even marked variations in the blood picture are found in normal healthy women, and may occur during menstruation, no definite relation to menstruation can be shown. The article is illustrated by a number of plotted graphs.

GANGRENOUS PERFORATION OF THE UTERUS.

It has been noticed among fatal cases of septic abortion that gangrenous perforation of the fundus sometimes occurs. Attention has been called to the peculiar shape of the gangrenous area, an inverted wedge like a keystone, suggestive of an infarct. As the possibility of an infarct in the uterus with its remarkable anastomoses seemed improbable, a careful study of the uterine circulation was undertaken by Lelercq and Crépin,³⁸ using minute dissections, injections and radiographs. They found that in

a considerable area of the fundus of the uterus, the arterioles are terminal or nearly so, the anastomoses being very fine if present at all, in marked contrast with the blood supply of the rest of the uterine corpus. Thus they establish the anatomical basis for an infarct, which might arise following a septic abortion. The matter is of medico-legal importance, for such gangrenous perforation cannot now be considered evidence of instrumental interference with pregnancy.

STERILITY.

To meet the well recognized inadequacy of instrumental dilatation of the cervix as a method of giving permanent relief to stenosis, Schumann⁸⁰ has devised a plastic operation on the cervix. The cervix is dilated to about one and one-half inches with a Goodell dilator, and a strip of mucous membrane is removed from the posterior wall of the canal up to the internal os. A flap of vaginal mucous membrane is lifted from the posterior vaginal vault, the denuded area of the vagina closed, and the flap then sutured to the raw area of the posterior wall of the canal with fine catgut. After the graft has taken, it is cut free at its base of attachment. The procedure is said to be surgically simple of performance, but no results are reported.

X-RAY IN DIAGNOSIS.

The use of collargol solutions in connection with the x-ray as a means of diagnosis in diseases of the uterus and tubes, suggested itself to Rubin,⁴⁰ in view of the employment of these adjuncts in the diagnosis of the disease of other hollow organs.

It has here certain greater dangers, theoretically, as septic material may be carried from infected tubes to the peritoneal cavity, or, in aseptic cases, irritating material, which will give rise to aseptic peritonitis. That fluid introduced into the uterus will sometimes pass through the tubes into the peritoneal cavity, is clear from certain cases in which this passage has been observed. But the frequency of this occurrence is by no means definitely established.

From his experiments Rubin concludes that five cubic centimeters of a five per cent. solution of collargol is necessary, which under pressure of about three millimeters of mercury, can be injected without pain, and represents a safe and adequate amount. Irritation rarely follows. The method is of aid: (a) in diagnosis of the patency or occlusion of the tubes; (b) in differentiating intra- from extra-uterine tumors; (c) in certain malformations and displacements; (d) in determining whether a single or a double salpingectomy had been done at a previous operation. The number of cases reported is small, but some such method as the one suggested would seem to have a considerable field of usefulness.

DIATHERMIA.

Heat as a therapeutic agent in gynecological diseases, has been employed for a long time, and the methods of application are extremely numerous: hot sitz baths, compresses, douches, hot air, the thermophore, and Flatau's pelvitherm may be mentioned. Recently diathermia has been applied,—the application of heat by means of high frequency, alternating electric currents. This differs from the other methods in that the heat does not penetrate from the outside, but is generated in the interior.

Sellheim was the first to employ it, but only for experimental purposes. Bruehl made the first therapeutic use and claimed relief of pains in old inflammatory conditions in the pelvis could be obtained more satisfactorily than by any other method of local treatment. Interested through the reports of these investigators, Kowarschik and Keitler⁴¹ have used diathermia for about one and one-half years to test its therapeutic value. Although the method contains the possibility of inflicting harm, no burn has been seen in several thousand treatments by Kowarschik, indicating safety if properly used; for, as the authors say, burns may come from the ordinary thermophore. The application may be by means of two external electrodes, one over the lower abdomen and the other under the sacrum; or an internal electrode in the vagina and an external electrode like a girdle.

The indications are every form of disease in which heat is indicated, for heat is a most excellent method of producing hyperemia. It increases absorption, relieves pain, and has been applied with success in one case of dysmenorrhea.

The contraindications are, all recent infections, especially if there is febrile or subfebrile temperature. The presence of pus is a strict contraindication. Bleeding is another contraindication, for it is always increased by the heat, as would be expected.

The effect is much the same as the hot air treatment, but is more quickly obtained. The effect on the general circulation and the heart is less than that of the hot air. Fifty cases have been treated with results so favorable that the authors feel sure that diathermia has a distinct place among our therapeutic resources.

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Reports of Societies.

BERKSHIRE DISTRICT MEDICAL SOCIETY.

A meeting of the Berkshire District Medical Society was held on November 4, 1915. The program consisted of a symposium on Diabetes. The following papers were read:

"The Allen Treatment of Diabetes." Dr. J. B. Thomas.

"Observations on Diagnosis and Treatment." Dr. M. M. Brown.*

"Urinary Tests for Sugar," Dr. Thomas Flournoy.

Dr. O. L. Bartlett presented the following case:

CORRECTION OF CICATRICAL ECTROPION AFTER A SEVERE BURN.

Miss C., an epileptic, had fallen on a hot stove and burned off half her left ear, the side of the face and cheek nearly to the mouth, the eyelids and eyeball.

When brought to the House of Mercy a month after the accident, the stump of ear had healed, the face nearly so, and the upper lid was completely everted, the margin attached to the brow by a dense cicatrix and the conjunctiva badly ecchymosed, showing only a small part of the cornea with a large sloughing ulcer. After the ulcer had healed, the eyelid was dissected from the brow, under ether anesthesia, stitched to the lower lid after freshening the edges, and then brought down as far as possible and attached to the cheek to allow for the contraction of the graft. A Wolff's flap was then dissected from the arm in the usual way, in area one-half larger than the surface of the lid to be covered, without any subcutaneous tissue, and stitched into place.

In four days, the dressings were removed and healing had begun. Though the surface for the most part looked dark and likely to slough, the flap soon took on a healthy appearance and healed nicely without even a stitch abscess. The stitches were removed from the cheek in a few days, but the effects of the tarsorrhaphy (ankyloblepharon) will remain for several months.

The lady has a blind eye, but her appearance will be remarkably improved.

See JOURNAL, page 317.

Harvard Medical School.

HEADACHE.*

DR. HARVEY CUSHING: There is no one symptom more likely to bring a patient to consult a doctor than an "ache," and we associate aches with the back, the belly, and the head. The subject of aches in any one of these three situations would be deserving of a place in this series of exercises which are supposed to be exercises of preparedness for the problems you are most likely to encounter early and often in medical practice.

Of all aches, those referred to the cranial chamber are perhaps the most common. Headache is admittedly a symptom of disease, not a disease in itself, just as cough, for example, is a symptom, and yet certain states in which headache is the paramount feature and of which the underlying cause is uncertain or unknown, are spoken of as essential headache or cephalalgia or hemicrania, just as we are compelled to call certain cases of epilepsy or hydrocephalus of obscure origin, essential or idiopathic epilepsy or hydrocephalus.

Hence, in our hospital records, headache or cephalalgia or, if the symptoms are unilateral, hemicrania, may appear as the diagnosis, though such a primary diagnosis is becoming more and more rare as our clinical acumen increases. A glance through the periodical indices under the topic "headache" will show how varied are the conditions under which this symptom is discussed, and serve as an indication of some of the causes of headache which must be considered when a patient presents himself with this as his major complaint. Thus we find headaches indexed as cardiac, sick, syphilitic, neurotic, nodular, idiopathic, rheumatic, strabismic, constitutional, indurative, refractive, reflex, neurasthenic; headaches due to gastric disturbances, to intestinal intoxication, to epilepsy, to constipation, to sinus disease, to renal disease, to carbon monoxide and other forms of poisoning, to pregnancy and pelvic disorders, to hypertension, to infectious diseases, and so on, almost without end. These, I may recall, are merely the titles of articles under which the symptom "headache" thus qualified is the subject of discussion.

Imperfect as such a subdivision may be, we, nevertheless, may conveniently divide headache into three groups: The first includes the *simple* cephalalgias of a relatively mild type, with which we are all unhappily more or less familiar; the second comprises the *essential or idiopathic* headaches, those in which the cause is not apparent, and under this group occurs the large and important division comprised under the designation "migraine"; and the third, the *symptomatic* headaches, which are definitely expressions of recognized disorders of one sort or another which produce intracranial discomforts.

Though I would not wish you to apprehend that every patient you will see with an obscure headache is going to give you in practice as great difficulty as is given by those who, owing to an unrelieved complaint, finally drift into hospitals, nevertheless, I shall illustrate our topic by bringing before you a few of the patients who happen to be in the surgical wards of the Brigham Hospital at the moment with the primary complaint of headaches.

* Abstract of lecture delivered on January 28, 1916.

1. This man, a stationary fireman, 30 years old, complains of headache and backache, onset four years ago. He has been coughing and spitting up blood, which appears to come from the back of the throat. X-ray showed complete obscuration of right frontal sinus. At operation the right frontal sinus was found to be absent, thus accounting for the x-ray findings. On the left the membrane was of normal appearance. Spinal fluid negative. Wassermann negative.

The etiology of his headaches, therefore, not yet established, but is possibly due to sinus disease elsewhere in view of his expectoration. If his headaches were really due to pressure, which seems unlikely, we could thus account for his backache, for it is not uncommon to see the two aches combined when there is increased spinal fluid pressure.

2. The next patient is a woman of 43, who has had headaches during her early life which she calls "sick headaches." Fourteen years ago she was very much run down, had an inferior dental neuralgia, and following the division of the nerve, she was free from discomforts until three years ago.

Three years ago she began having severe suboccipital headaches which could be produced by exposure to cold. They were almost always relieved by massage and she has received osteopathic treatment. She has had many repeated attacks of "sore throat," and about three years ago, at the time of the onset of the headaches, some of her joints began to enlarge. Always during the period of headache, the muscles in the suboccipital region become hard and tender, and, as I have said, the discomforts are lessened by massage and hot applications. Cold cannot be endured.

This is probably a case of so-called "rheumatic" or "indurative" headaches, and in view of her enlarged tonsils and involved joints, a tonsillectomy should be contemplated.

3. Single man of 31 has had headaches of varying intensity for seven months. There have been one or two remissions after neosalvarsan administration. The headaches are present mostly through the day. There is some photophobia and "pain in the back of the eye." Eyesight has become poor, but glasses improved it. He is very drowsy. Physical examination shows choked discs; ++ Wassermann on blood and spinal fluid, 200 cells in spinal fluid. Decompression was done to relieve pressure.

This is a clear case of meningeal lues. The pain usually is more severe at night in these cases. A vigorous antilutetic treatment is indicated, but was badly tolerated before, owing to his pressure symptoms.

4. This married woman of 49 was brought here unconscious after a convulsion. Her complaint is of nocturnal headaches and backache for the past two months. They are of varying severity, start in the occiput and radiate especially to the frontal region, and are usually accompanied by tinnitus on the left side, once accompanied with vomiting. The headaches never come during the day. In the past two months she has had difficulty in "saying the right word" (motor aphasia), she has become irritable in disposition, and her memory has failed. The pupils are unequal. Her husband has locomotor ataxia, and we find her Wassermann on blood and spinal fluid ++. Cell count, spinal fluid, 14.

The diagnosis is cerebral syphilis and early dementia paralytica.

5. This young woman of 27, single, complains of headache of two years' duration, intermittent, worse at night, at onset (two years ago) in the back of the neck, now two to three times a week with feeling of dizziness, numbness in head, and as though "head would burst." There is a slight weakness on the left side. There is a history of instability (falling while at play as a child). The vision of right eye is much blurred, but eye grounds are normal and there is no actual failing vision. There is moderate muscular tremor, and a history of justifiable nervousness. She has seen many doctors and has always been given pills and been told that she was anaemic. Her blood shows Hgb. 84%; reds 5,400,000.

The etiology of her headaches is not clear, but she has worked for 13 years without intermission in a factory in poor surroundings and is much run down, and there may be no organic cause for her discomforts, though she was sent here with the diagnosis of cerebellar tumor.

6. Woman of 33, married, complains of headaches and failing vision for past 18 months. She has had headaches since 17, but two years ago they changed in type. They begin as pain in spine, which ascends through back of head to forehead, and are often confined to left side of head. They are sometimes accompanied by nausea and vomiting. There is history of a definite renal disease five years ago, for which she was in a local hospital; and also of a fall. Glasses have not changed headache. She has amenorrhoea, is drowsy, and has a subnormal temperature, which would make one suspicious of pituitary disease; and we find a bilateral optic atrophy and homonymous hemianopsia. X-ray shows sella turcica almost destroyed.

The headache in these cases is probably due to stretching of the dural capsule of the gland as the structure enlarges. Pituitary headaches are very characteristic and the relief from surgical measure is often very striking.

7. Woman of 38, married, having always had headaches; says that four years ago they increased in severity and frequency, and were accompanied by nausea and vomiting, without relief, and by failing vision. They gave a peculiar feeling of tightness or filling up of the head. In the past four months she has had some remission of the headaches. She notes that her hands and feet have been large for five years, and that she has had a "thick feeling" in arms and hands for about the same time. There is some photophobia. Examination shows primary atrophy of optic disc, with temporal hemianopsia and unequal pupils. Wassermann and cell count negative. X-ray shows a large amount of destruction in the region of the sella.

This is the reverse condition from the previous case, so far as the hypophyseal symptoms are concerned, but in both there is an enlarged gland with pituitary headache.

8. Man of 45, single, complains of frontal headaches, increasing in severity of late and accompanied by some dizziness, but no nausea. Headaches of late have incapacitated him for work. Patient is markedly dystrophic sexually, feminine in voice and somewhat so in contour. X-ray shows normal sella.

In this case there may be dural nodules or hyperostoses as a cause for the headache. There is a thickening of the bones of the skull that recalls

the thickening of the frontal bone sometimes seen after pregnancy.

9. This woman of 63 has had left trigeminal neuralgia. After alcohol injections and various other forms of treatment, she had the ganglion resected 10 days ago. At operation, as is usual, cerebrospinal fluid was lost, and for the following day or two she had headache limited to the right side of the head, though it is to be noted that the operation was done on the left side.

This is a common observation and is significant in connection with the theory of headaches in general, for the brain itself is insensitive, but the dura is extremely sensitive, and inasmuch as the trigemini supplies all of the membrane on one side, except just around the foramen magnum, after a ganglion operation the capacity of appreciating a headache on the side of the neurectomy seems to be lost. It is of further interest to note that the headaches of pregnancy come on at a time when the pituitary is enlarged, and in similar ways we may in many cases clearly attribute this symptom "headache" to dural stretching. The region of the foramen magnum is supplied by the vagus, and in gastric disorders pain is often referred to this region.

Changes in cerebrospinal fluid pressure may give headache, and another common causative factor is the cerebral edema which accompanies many states, such as poisoning by alcohol, ether, and some other drugs. Indeed, in some of these conditions there may be merely an increase in the outpouring of the fluid from the plexuses.

The theory of the production of headache, as you will see, is not at all clear, but distension or distortion of the sensitive pachymeninx from one cause or another is a possible explanation for many types.

ALAN GREGG, A.B.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, FEBRUARY 15. AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, President, in the chair.

EXHIBITION OF CASES.

DR. CHASE: A patient with a fracture of the scaphoid bone of the wrist and a dislocation of the semilunar bone.

DR. F. DONAHUE: Industrial Insurance and its Relation to Fractures of the Carpal Bones.

PAPER OF DR. J. W. SEVER.

A RESEARCH ON OBSTETRICAL PARALYSIS, ITS CAUSATION AND ANATOMY.

About 300 cases of obstetrical paralysis have been observed in the Children's Hospital. This is a large number for one institution. The present report is based upon a study of about 150 selected cases.

The paralysis follows a difficult labor. Very often there is a vertex presentation and forceps are used. The mother is usually etherized. Accompanying such a delivery there is usually an asphyxia of the child.

As a rule, the deformity is noticed at once, or within twenty-four hours. The child appears to have a flail-arm. The whole arm usually is affected at first.

The upper type of paralysis results from an injury to the fifth and sixth divisions of the plexus. The sheath is commonly ruptured and this is followed by hemorrhage. In the severer forms, there is more injury to the plexus, amounting occasionally to a complete rupture of all the cords. Later scar tissue appears and in time this may press upon uninvolved nerves, leading to a still greater loss of function. In such severe cases there is found to be an injury to the homolateral half of the cord.

It is very rare to find tenderness above the clavicle even in the earliest cases. No injury to the shoulder joints has been noted in any of the early cases of real obstetrical paralysis. There are neither joint subluxations nor bony changes.

Later in the course of the affection, certain definite secondary changes make their appearance, such as the persistent inward rotation of the arm, the marked contracture of the pectoral and subscapular muscles, the secondary dislocation of the head of the radius, and so on.

In the past such deformities have been treated, purely from the neurological point of view, *i. e.*, with electricity, massage, passive motion, etc. Such conditions should be handled like any other orthopedic problem. It is essential to place the arm (in the early cases) in the correct position and to retain it so until the paralyzed muscles regain their function, or until the chances of bad contracture are lessened. At least 80 to 85% of the cases make a complete recovery, so far as paralysis is concerned. The contractures which appear secondarily in the untreated cases, of course, will require appropriate care.

The lower arm type (or, more correctly, the whole arm type) involves both the upper and lower segments of the cord. It usually comes with breech presentations when the arms are extended. The pull then comes more directly and more horizontally on the plexus. Only seven of the 140 cases showed a lower arm type.

A pupillary inequality accompanies most of the cases of the lower arm type. The homolateral pupil is smaller than the opposite one and reacts poorly to light. This is a sign indicating a severe nerve injury.

It seems fair to state that probably a certain percentage of these cases is due to poor obstetrics rather than to difficult labors.

PAPER OF DR. ALBERT FUERNBERG.

HEREDITARY DEFORMING CHONDROPLASIA, "MULTIPLE EXOSTOSES"

This disease is usually considered to be a rare affection. Within the past year, I have been able to collect ten cases in Boston.

It appears to be a distinct clinical entity for the following reasons: First, it is a disease of the epiphyseal cartilage, a dysplasia of the cartilage; second, it is accompanied by very characteristic deformities of the bones; third, it is hereditary. Four or five males are affected to one female. While unaffected males never transmit the disease to their offspring, unaffected females may do so. It is only rarely met with in the native born Americans. Of the foreigners, the Germans appear to be most

frequently affected, the French next, and the English the least. Cases, however, have been reported from all parts of the world.

Nearly one-half of the published cases of congenital subluxation of the proximal end of the radius really belong in this class.

Osteochondromata are of frequent occurrence in this disease. Fully five per cent. of the cases ultimately succumb to metastatic tumors of this nature.

(Lantern slides were shown to illustrate both papers.)

ERNEST G. GREY, M.D.

Book Reviews.

Pellagra. An American Problem. By GEORGE M. NILES, M.D. Second Edition, Illustrated. Philadelphia and London: W. B. Saunders. 1915.

The first edition of this first original work in English on pellagra was reviewed in the issue of the JOURNAL for May 30, 1912, (Vol. clxvi. p. 822). In this second edition, many changes and additions have been made. In particular the chapter on etiology contains the result of the recent investigations by Dr. Joseph Goldberger and by the Thompson-McFadden Pellagra Commission. The chapter on treatment contains a number of recent therapeutic suggestions, including the use of emetin and of scarlet red ointment. In his original work the author expressed his belief that pellagra is a disease belonging in the class of food intoxications. While the etiology of pellagra can hardly be considered as yet entirely settled, the tendency of investigation during the past four years has been in the direction of confirming this belief. The book should continue to maintain its position as an authoritative monograph on the American aspects of pellagra.

The Baby's First Two Years. By RICHARD M. SMITH, M.D., Assistant in Pediatrics, Harvard Medical School; Assistant Visiting Physician, Children's Medical Department, Massachusetts General Hospital, Boston. With Illustrations. Boston and New York: Houghton-Mifflin Company. The Riverside Press, Cambridge. 1915.

This little book for mothers is one of the best, if not the best, of its kind which we have seen. It is founded on the teachings of the Harvard Medical School, and is the first book for mothers which gives the Boston point of view as to the care and feeding of babies. Being written in part by a physician and in part by an experienced mother, both the scientific and practical

sides of the subject are given due consideration. The advice given is sound and sane. Nothing which it is wise for a young mother to know is omitted. Where everything is so good, it is difficult to select special portions for commendation. We cannot, however, forbear from calling attention to Chapter XIII, "A Typical Day," written by Mrs. Greene. A mother who has mastered it can hardly go astray in the daily care of her baby. A unique feature of the book is, as is stated on the title page, that the author's proceeds from the sale of the book are to be devoted to the work of the Milk and Baby Hygiene Association of Boston. It is a pleasure to recommend this little book to all present and future mothers.

The Operations of Surgery. (Jacobson.) Sixth Edition. By R. P. ROWLANDS, M.S., Lond.; F.R.C.S., Eng., Surgeon to Guy's Hospital; Lecturer on Anatomy to the Medical School; and PHILIP TURNER, B.Sc., M.S., Lond.; F.R.C.S., Eng., Surgeon to Guy's Hospital; Teacher of Operative Surgery to the Medical School. With 797 illustrations (40 in color). Volume I: The Upper Extremity; The Head and Neck; The Thorax; The Lower Extremity; The Vertebral Column. Volume II: The Abdomen. New York: The MacMillan Company. 1915.

These two volumes of approximately 1000 pages apiece, represent a careful revision and a partial rewriting of the previous fifth edition, but Mr. Jacobson himself no longer appears as author. Mr. Rowlands and Mr. Turner, to whom the work of producing the sixth edition has been entrusted, are well known and well qualified for the task; having not only a thorough knowledge of surgery, but also an exact familiarity with anatomy to aid them in the production of the new edition. The work is larger than Treves' two volumes, and much larger than most other English text-books on operations. The authors say that they have tried to keep before them two main objects—"to do justice to the work of others, and to save our readers some of the difficulties and anxieties which have beset our paths." They have been successful. American authors and operators have been widely quoted, and with good judgment. The list of operations is complete, including those of gynecology, genito-urinary surgery, and the eye, ear, nose and throat. The book is distinctly conservative; the descriptions are clear and complete; the indications for operations are concisely considered; the illustrations well chosen and admirably reproduced; the type distinct and of good size. The book maintains the high standard of previous editions. It may be cordially recommended to surgeons and advanced students.

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PIGNET'S STANDARD AND CHINESE STUDENTS.

No thoroughly satisfactory system of comparative estimation of physical development has been found, but among the most serviceable standards for this purpose is the formula devised by Pignet, a French army surgeon, who, in the course of various anthropological studies on soldiers and recruits evolved an empirical standard of physical fitness. This standard has been widely used in European armies as a means of judging the physical condition of recruits and the effect of training. His formula is $F = H - (C + W)$, where F is the empirical factor, H the height in centimetres, C the chest girth in centimetres at maximum expiration, and W the weight in kilograms. The larger the factor the poorer is the physique. In rare cases F becomes negative, but this is only in case of men with exceptionally robust development.

According to the size of this factor, Pignet classified men as very strong where the factor was less than 10, strong between 10 and 15, good between 15 and 20, medium between 20 and 25, weak between 25 and 30, very weak between 30 and 35, and useless for the army over 35. This standard has been found applicable to Europeans, but that does not guarantee its accuracy for other races. It will, of course, give an exact comparison, but it by no means establishes a normal. It has been applied, for example to the Indian army, by R. H. Firth, who tabulated the measurements of 5676 Indian soldiers in an article submitted to the Royal Army Medical Corps Journal in October, 1912. The results were as follows: Factor less than 10, 2.9%; factor 10 to 15, 9.3%; factor 15 to 20, 16.2%; factor 20 to 25, 17.3%; factor 25 to 30, 25.5%; factor 30 to 35, 16.4%; and over 35, 11.7%. Thus about 50% belonged to the weak classes, and yet the percentage of men showing the normal average for the Indian race may have been much higher.

It must be accepted, then, that any such standard of physical development can be considered a standard of normality only for the race from whose measurements it has been deduced. Beyond that race it gives merely a graphic comparison of measurements. With these considerations in view, it is interesting to compare the physical measurement of a group of Chinese students with such standards. In order to utilize figures in inches, feet and pounds, Pignet's formula has been modified by Captain J. A. Black, of the Royal Army Medical Corps, to the following:— $F = (W + C) - H$, where W is the weight in pounds, C the chest girth in inches at full inspiration, and H the height in inches. This scale corresponds to Pignet's formula as follows: over 120 very strong; 110 to 120, strong; 100 to 110, good; 90 to 100, fair; 80 to 90 weak; under 80 useless for the army.

In the annual report of the physical director of the college of Yale-in-China for the year ending March 30, 1915, figures are given applying this formula to the measurements of 181 students. Of these, 66% gave a factor below 80, 21% were between 80 and 90, 10% between 90 and 100, 3% between 100 and 110, .5% between 110 and 120; and .5% over 120. Thus only 14% of the 181 ranked above the weak and useless classes. Various things explain this marked deficiency in physical development, granting that

the standard can be applied justly to these students. Chief to be noted is the hereditary disinclination of the Chinese scholarly class for physical work of any sort. Even athletes have to overcome an age-old prejudice against exercise. Physical work is considered degrading and fit only for artisans, farmers and coolies. The scholar will have none of it. Hence the characteristic posture of the Chinese,—flat-footed on the heels, abdomen protruded, and chest sunken.

Continuing with the report, medical examination of the Yale-in-China students showed the following conditions: stooping posture, 37%; head forward, 78%; shoulders rounded, 49%; flat chested, 33%; costal angle narrow, 42%; pigeon breast, 6%; funnel breast, 6%; scoliosis, 8%; abdomen rounded, 9%; toes crowded, 20%; weak tarsal arches, 29%; good nutrition, 36%; fair nutrition, 47%; poor nutrition, 15%; general development good in 36%, fair in 40%, poor in 24%; minor abnormalities present in 14%; 5% suffered from trachoma, and in 35% the vision was less than 20/30; 8% had defective hearing. Polyps or narrowed nostrils were present in 8%, enlarged turbinates in 40%, diseased tonsils in 45%. In 34% the palpable vessel walls were thickened, murmurs were heard in 28%, and in 22% there was evidence of definite valvular disease. Three per cent. showed evidence of venereal disease.

The effect of athletics in improving the physical and mental condition of students can be measured here with considerable accuracy if careful examinations and measurements are made annually. It is to be hoped that this will be done, as it will throw light on the best line of development of school athletics in general, as well as indicate the response of Chinese students to physical culture.

COUNTY CARE OF TUBERCULATES IN MASSACHUSETTS.

ON February 19, the Massachusetts State Department of Health submitted to the general court a report on the present status of tuberculosis and provisions for its care in this Commonwealth. With this report is submitted also the draft of a proposed bill authorizing the commissioners of all counties, except Suffolk,

Nantucket and Dukes, to provide adequate hospital care for all consumptives in cities and towns, the total population of which is less than 50,000, not having, but needing, hospital treatment. The provisions of this bill would become available on January 1, 1918, if the cost of the buildings did not exceed \$10,000 each, and on September 1, 1918, if the cost were more than \$10,000.

In its report the department maintains that the need and expediency of additional consumptive hospital provision is so clear as to admit of no debate. It believes that the smaller communities should not be called upon to finance alone the construction and maintenance of these hospitals, and therefore presents the county bill to meet these conditions.

Facilities in Massachusetts for hospital care of tuberculates are considered in the report to be now only two-thirds complete.

"Exclusive of beds for incipient pulmonary tuberculosis and for the non-pulmonary type, a total capacity for advanced consumptives of approximately 3600 to 4000 beds would solve the consumptive hospital problem. There are now 3165 tuberculosis beds, but of these 1068 are in the state sanatoria that are designed primarily for incipient cases. This would indicate that we have approximately one-half enough beds at present for complete hospitalization of advanced consumptives.

"Beds provided for consumptives by the larger municipalities through the generosity of private philanthropists, or charitable organizations, total 1176. Of the twelve cities, which come under the 50,000 classification, there are but three,—Cambridge, Lawrence, and New Bedford,—that are providing adequate hospital facilities for consumptives. Estimates of the number of additional beds needed by this group of cities as a whole is approximately 750.

"For the cities and towns having less than 50,000 inhabitants, there already exist for the entire group only 221 available beds. In other words, there is a deficiency of approximately 1400 beds for this group of communities, which is twice as great a deficiency as for the cities of 50,000 and more inhabitants.

"Aside from the bed provision made by the Commonwealth itself, and by the cities and towns, or by private organizations, there are in the state a certain number of beds which practically serve more than a local community; these are mostly private paying sanatoria. The total number of such beds, 165, is so small as not to be a factor of any consequence in the general problem."

In view of these conditions, the report concludes that:

"It becomes a paramount duty of the Commonwealth through appropriate action of the General Court to make such provision for the consumptive hospital needs of smaller communities throughout the Commonwealth as will adequately solve the local consumptive hospitalization needs of each and every community in the Commonwealth. County or district consumptive hospitals, so planned as to provide an efficient unit of administration without imposing the burden of excessive cost or of unreasonable difficulty of access upon citizens of every community served thereby, are the only practical type of institution that will meet the needs of the situation.

"Four possible solutions of the problem are given, namely, by the state assuming entire responsibility for tuberculosis hospitalization, by separate municipalities and towns, by leaving present conditions as they exist, and by evolving a new comprehensive and uniform standard of procedure to supplement gaps in existing hospital provisions. The department, in advocating the latter, says:

"This offers the opportunity of a new standard, both comprehensive and uniform, for the care and treatment of consumptives, by providing a logical solution of the problem. It furnishes a basis for continuity of effort in the plan of hospital provisions; thus, by this plan there will be furnished state hospital provision, county hospital provision, and municipal hospital provision; the county hospital provision to meet the needs of the smaller cities and towns, and to give them the same standards of service offered by the state and larger municipalities. In other words, a three-link chain of service, instead of two.

"The county unit appears to this department the only logical means for providing state-wide tuberculosis hospital facilities for consumptives for towns and cities of less than 50,000 population, not already provided for under the laws of the state. In these communities there is a distinct need of hospitals for consumptives which neither the state nor the municipalities have met thus far. Such a county plan should be based on a minimum bed provision of one bed to each death from tuberculosis, as outlined elsewhere in this report. With this general principle firmly established, it is the opinion of this department that the details of procedure should be properly left to the authorities who are charged with the responsibility of providing such hospital care, rather than to attempt to regulate by statute the individual needs of each community, and the accompanying legislation has been drafted with this object in view."

Further editorial discussion of this subject will appear in the JOURNAL when this bill comes definitely before the legislature for consideration.

AMERICAN FIRST AID CONFERENCE.

"A stitch in time saves nine," is a proverb applicable to more important events than the unravelling of a thread. The prompt use of first aid appliances in accidents occurring among miners, railroad men, factory employees, and soldiers has lessened infection and shortened the period of disability.

This was the conclusion arrived at by the First Aid Conference, held at Washington, in August, 1915, and reported in the *Military Surgeon* for January, 1916, and also in this JOURNAL. At this conference were representatives of the Medical Departments of the Army, Navy and Public Health Service, of the Red Cross, chief surgeons of a number of railroads of the United States, civil surgeons representing national surgical associations, general officials representing railroads, and representatives of manufacturers of first aid supplies. General opinion favored the distribution of some sort of simple first aid packet, and the Conference⁹ unanimously adopted a resolution leading to the appointment by President Wilson of a board of standardization.

This commission has been appointed. It will investigate first aid methods, packages, the standardization of first aid equipment, and a course of instruction to be followed throughout the country. The Commission will report to the American First Aid Conference upon all the preceding subjects, and has already sent out a questionnaire to many surgeons.

Aside from the undoubted value of intelligent first aid in case of accidents, it would seem that this movement, of national scope, must also be very useful in a preventive way. Most accidents are due to carelessness; by keeping before the public the results of negligence, individuals will think to exercise that grain of caution which may mean the difference between health, on the one hand, and on the other, permanent injury or death.

RABIES EPIDEMIC IN CALIFORNIA.

THE monthly bulletin of the California State Board of Health for December, 1915, and January, 1916, contains an interesting account of an epidemic of rabies among wild animals in the northeastern counties of the state. The epi-

demic has been brought under control by the State Board of Health with the coöperation of the U. S. Forestry Service and the Biologic Survey. Rabies became prevalent in domestic dogs in the summer of 1909 throughout the state, except in the northern section. Late in 1914 this section was invaded.

In 1910 rabies became epidemic in Southeastern Oregon, where it was spread largely by infected coyotes, and was brought under control by a vigorous campaign of the Oregon State Board of Health. Late in 1915 the disease became epidemic in coyotes in Lassen and Modoc counties in Northern California, and vigorous measures were at once instituted. The infected area was nearly 9000 square miles in extent, greater than Massachusetts or New Jersey. Rifles, traps and strychnine were the weapons used, with a system of thorough policing of the district and the offer of bounties.

Hundreds of horses, cows and other domestic animals and stock were bitten by rabid coyotes and large numbers died from rabies, the diagnosis being confirmed by histological methods. It is of interest to note the common symptoms of rabies in animals recommended to the public in the affected district. The chief ones are as follows: Sudden change of disposition, unusual nervousness or irritability, tendency to leave home, change in voice, refusal to eat, tendency to snap or bite without provocation, and weakness or paralysis of the legs or lower jaw.

Such an epidemic should be enough to convince even the most skeptical that there is such a disease as rabies, that there is a sure means of preventing it, and that proper quarantine and control of dogs will eliminate it.

MEDICAL NOTES.

BACTERIOLOGIC FINDINGS IN RECENT OUTBREAK OF GRIP IN NEW YORK.—As the result of the bacteriological study of fifty cases diagnosed as "grip" by physicians of New York, the Department of Health announced that the streptococcus has played the leading rôle in the outbreak of grip and pneumonia which visited this city last month. This germ was found in large numbers in twenty-six of the fifty specimens examined; the diplococcus lanceolatus was present in nineteen cases, and the influenza bacillus in nine. The investigations were conducted at the Research Laboratory of the Department of Health, and were directed by Dr. Anna W. Williams,

assistant director of the laboratory. Each specimen was examined both microscopically and by means of cultures. Many of the specimens showed large numbers of several different bacteria, and this accounts for the fact that the following summary yields a total greater than the number of specimens examined.

	Cases
Streptococcus	26
Diplococcus lanceolatus	19
Micrococcus catarrhalis	18
Bacillus influenzae	9
Staphylococcus pyogenes	9
Bacillus capsulatus	6
Bacillus bronchisepticus	2
Vincent's bacillus	1

It is interesting to learn that a somewhat similar investigation conducted some months ago showed influenza bacilli in only one specimen out of twenty examined. In the present instance this germ was present in nine out of fifty specimens, a proportion which indicates that this germ also played a part in the recent grip outbreak. The micrococcus catarrhalis resembles in shape and staining reactions the germ of cerebrospinal meningitis, but is otherwise not related to that organism.

PREVALENCE OF SMALLPOX.—A recent report of the United States Public Health Service shows that smallpox is now prevalent in Vermont, New Jersey, South Carolina, Idaho, Minnesota, Illinois, Montana, Ohio, Iowa, Michigan, Indiana, Nebraska, Pennsylvania, Louisiana, Oklahoma, and Oregon. In the weekly report of the Service for February 11, a new focus of the disease is reported in Maryland and three in Minnesota. There have also been a number of cases in Texas and West Virginia.

LECTURES BY DR. ROSENAU.—It is announced that the Harrington Lectures at the University of Buffalo Medical School will be delivered this year on May 30, 31 and June 1, by Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene in Harvard University. Two of the lectures will be on Anaphylaxis, and the third on Education for Public Health Service as a Career.

APPOINTMENT OF DR. STRONG.—It is announced that Dr. Richard P. Strong, Professor of Tropical Medicine in Harvard University, has been appointed vice-president of the American International Corporation. It will be his duty to supervise sanitation of the districts in which the company's development work is located.

MEMORIAL TO VON BEHRING.—It is announced that the Prussian Ministry of Public Instruction has ordered the erection of a bust of von Behring in the Marburg Institute for Hygiene

in commemoration of the 25th anniversary of the publication of his work on serum therapy.

LONDON DEATH RATES IN DECEMBER, 1915.—Statistics recently published show that the total death rate of London in December, 1915, was 17.3 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 24.5, in Southwark, a populous district on the south bank of the Thames; and the lowest was 13.2, in Lewisham, a more remote southern suburb.

FEDERAL CONTROL OF TUBERCULOSIS.—On February 21 announcement was made in New York of a resolution recently adopted by the National Association for the Study and Prevention of Tuberculosis, urging participation of the federal government in the study and control of tuberculosis through the United States Public Health Service.

"The National Association proposes that by act of Congress a special division of tuberculosis be established in the United States Public Health Service with an adequate appropriation. This division should be manned by experts and should study the tuberculosis problem from every point of view and should, so far as possible, set up standards for the treatment and prevention of the disease throughout the country. One of the problems which it is proposed to study first would be that of the indigent migratory consumptive, particularly in the health resorts of various parts of the United States, such as California, New Mexico, Colorado and Texas. Another problem which it is proposed should be studied is that relating to the causes of tuberculosis. A bill introduced by Congressman Kent of California in the House and by Senator Norris of Nebraska in the Senate provides for some of the things which the national association asks for, and also for a federal subsidy to hospitals caring for non-resident consumptives.

"Commenting on the resolution, Dr. Charles J. Hatfield, executive secretary of the National Association for the Study and Prevention of Tuberculosis, says: 'In spite of the fact that tuberculosis is costing the United States from \$500,000,000 to \$1,000,000,000 every year in lives lost, the amount of money being spent annually by all private and public agencies is not much more than \$2,000,000; and while a nation-wide crusade to stamp out tuberculosis has been organized, we are still ignorant of many of the factors that produce it. A few thousand dollars wisely spent in scientific research under federal supervision, will secure results of incalculable benefit to this country.'"

FEDERAL CONTROL OF TRACHOMA.—The recently published annual report of the Surgeon-General of the United States Public Health Service calls attention to its efforts in the con-

trol of trachoma by the establishment of small hospitals in localities where the disease is prevalent.

"The Service now has five trachoma hospitals in the three states of Kentucky, Virginia and West Virginia, and so great has been the number of applicants for treatment that a waiting list has been established. In the past fiscal year 12,000 cases of trachoma have been treated, the larger proportion of which were cured, while those in which a cure was not effected have been greatly improved and rendered harmless to their associates. The great majority of these trachoma patients were people who lived in remote sections far removed from medical assistance, and who, but for the hospital care and treatment provided, would have remained victims of the disease practically the remainder of their lives.

"When it is considered that thousands of persons suffering with trachoma, a dangerous contagious disease, would otherwise remain untreated, it is realized how far-reaching results have been obtained through these trachoma hospitals and the other public health work done in this connection. It would be impossible to estimate with any degree of accuracy the number of people who have been saved from contracting this communicable disease by thus removing these thousands of foci of infection.

"In addition to treating persons with the disease, the hospitals have been used for educational work. Doctors and nurses have visited the homes of the patients and have explained how to prevent the development and recurrence of the disease. One thousand three hundred and eight such visits were made during the year in Kentucky alone. It has taken some time to educate the people afflicted with this disease to the importance of cleanliness and the use of simple hygienic measures in their daily life. That results have been obtained is evidenced by the noticeably better observance of hygienic precautions by those among whom the work has been done.

"In addition to the hospital work, surveys were made in 16 counties in Kentucky, especially among school children. Eighteen thousand and sixteen people were examined, 7% being found to have trachoma. Similar inspections in certain localities of Arizona, Alabama, and Florida resulted in finding the disease present in from three to six children out of every hundred. Periodic examination of school children for the disease, and the exclusion of the afflicted from the public schools, are two of the recommendations upon which the Public Health Service lays emphasis.

"One of the special features of the trachoma work was the giving of lectures and clinics before medical societies in various counties where trachoma hospitals could not be established. Patients were operated upon in the presence of physicians and the most modern methods of treatment demonstrated. Throughout, the pur-

pose has been to stimulate local interest in taking up the campaign to eradicate trachoma."

EUROPEAN WAR NOTES.

ANTHROPOLOGY OF WAR PRISONERS.—It is announced that the Academy of Sciences at Vienna has granted a subsidy equivalent to \$960 to Professor Pösch to continue his anthropologic measurements and photographing of the various ethnologic types among prisoners of war.

CASUALTIES OF GERMAN ARMY SURGEONS.—In the issue of the *Medizinische Klinik* for December 26, 1915, it is reported that to that date the names of 1084 German physicians were in the casualty lists. These names include 37 civilian physicians, 377 active medical officers, 373 medical officers of reserve, and 287 assistant medical officers. Of this total, 361 were killed, 142 severely wounded, 388 less seriously wounded, 102 taken prisoners, and 90 missing.

HOSPITAL UNIT FROM OTTAWA.—It is announced that a hospital unit is to be sent to the front from St. Francis Xavier College, Ottawa, Canada. The unit is to consist of 12 surgeons, 35 nurses, and 125 assistants and attendants. The unit will sail as soon as it has been accepted by the British War Office.

RED CROSS HOSPITALS IN AMERICA.—At a meeting in New York on February 17, a plan was initiated for the establishment of three Red Cross base hospitals in the United States, with a transportation unit and a hospital ship for the Atlantic coast. The sum of \$24,000 has already been given to equip one of these hospitals for the care of 500 patients. The transportation unit, which will be supplied with motor ambulances and litters, is to consist of 20 physicians, 48 nurses and 90 aids. The accumulation of non-perishable surgical, medical and hospital supplies, to be stored for emergencies, is to be undertaken by the department of Military Relief of the National Red Cross and of each of the Red Cross chapters.

WAR RELIEF FUNDS.—On February 26, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$99,631.60
Serbian Fund	81,312.47
Allied Fund	65,361.80
French Wounded Fund	47,851.05
Armenian Fund	34,500.61
French Orphanage Fund ...	28,793.32
Polish Fund	21,022.31
Surgical Dressings Fund ...	19,803.55
La Fayette Fund	18,584.53
Italian Fund	15,414.35

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending February 26, there were 277 deaths reported, with a rate of 18.99 per 1,000 population as compared with 261 and a rate of 18.18 for the corresponding week of last year. There were 5 deaths from influenza. Deaths from pneumonia numbered 32 against 40 last year.

There were 51 deaths under one year as compared with 35 last year, and 72 deaths over sixty years of age against 55 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 55; scarlet fever, 51; measles, 96; whooping cough, 42; typhoid fever, 3; tuberculosis, 39. Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 15.

Total deaths from these diseases were: Diphtheria, 10; scarlet fever, 1; measles, 3; whooping cough, 1, and pulmonary tuberculosis, 25. Included in these were the following non-residents: Diphtheria, 3, and tuberculosis, 1.

HOSPITAL BEQUESTS.—The will of the late Lewis B. Carr, of Arlington, Mass., who died on February 11, has been filed for probate at the East Cambridge Court. Among many charitable bequests is one of \$5000 to the Symmes Hospital, Arlington.

The will of the late Lucy A. Norcross, of Boston, who died on February 13, was filed for probate on Feb. 16, in the Suffolk Court. It contains a bequest of \$25,000 to the Massachusetts General Hospital, contingent upon the death of the testatrix's daughter without issue.

INFANT MORTALITY IN WATERTOWN.—The recently published report of the Board of Health of Watertown, Mass., indicates an infant mortality rate in that city of only 45.7 per ten thousand, the average rate for the United States being 120. The general death rate of Watertown in 1915 was only 7.4, and for the preceding decade only 12.3. The birth rate was 27.5 in 1915, as against 24.1 in 1914. There was a great decrease in the incidence of typhoid fever, and a general decrease in all other infectious diseases, except tuberculosis.

EXPERIMENT IN OPEN AIR SCHOOLS.—The JOURNAL, in the issue of January 20, 1916, commented on the experiment carried on by the Winchester public schools in maintaining an open-air class in one of the school buildings. A further experiment has been tried with conducting a class in a room in which the windows are screened with cloth.

The open-air room of the Winchester school in 1914-15 was a complete success, but it brought two problems: how to continue the plan for the children themselves who have been in the ex-

periment, and how to extend it or secure approximate benefits for other scholars without large expenditure for special clothing. The plan of screening rooms is in the way of an attempt to find a satisfactory answer to these needs. It is not practicable to make all the rooms out-door rooms, but the benefits of fresh air should be secured for as many pupils as possible.

The plan followed at the Winchester schools is to place in each window a cloth screen equal in size to one sash. When the schools are in session the screen takes the place of the ordinary window sash, which is thrown open. The theory is that there will be constant passage of air through the cloth, and this will not cool the room any more rapidly than does the cold glass of the ordinary window. The room is, therefore, kept at the ordinary temperature, but the air will be fresh. The civics committee of the Fort-nightly Club, which helped in the out-door room experiments, has equipped two rooms in one school, while the school committee has fitted out two others.

The results of the two methods have been computed in figures covering a year's time for the open-air room and for four months for the screened room, and they are interesting:

SEPTEMBER, 1914, TO JUNE, 1915.

	Height.	Weight	Hemoglobin.
Regular	2.0 in.	4.8 lbs.	3.7%
Open air	1.5 in.	5.1 lbs.	8.2%

SEPTEMBER TO DECEMBER, 1915.

Regular	0.7 in.	4.4 lbs.	0.4%
Open air	0.9 in.	3.5 lbs.	5.7%
Screened	0.7 in.	3.4 lbs.	3.4%

Obituary.

ROBERT ALLEN BLOOD, M.D.

DR. BLOOD, who was surgeon-general of the Massachusetts Volunteer Militia from 1896 to 1904, died at Lake Sunapee, N. H., February 21, 1916, aged 77 years. He was born in New London, N. H., April 30, 1838; served in the army as private in the 11th New Hampshire Volunteers from August, 1862, to May, 1863, when he was mustered out because of wounds received in the battle of Fredericksburg. Settling in Charlestown after the War, he entered Harvard Medical School and was graduated with the class of 1870, and practised there from 1873 until 1904, when he moved to Brookline. He was a counselor of the Massachusetts Medical Society from the Middlesex South District in the years 1892-1897.

Entering the militia under Governor Greenhalge as medical director on the staff of Brigadier General Bridges with the rank of lieutenant

colonel, in May, 1905, he was made surgeon-general a year later on the death of Surgeon-General Edward J. Forster, and held the office until March, 1904, when he resigned to resume practice.

Dr. Blood was at one time surgeon to the Soldiers' Home, Chelsea; he was a Mason and an Odd Fellow, and a charter member of the Charlestown Club, of which he was president; he was also president of the Association of Military Surgeons of the United States. He had made his home in George's Mills, N. H., since 1910.

A widow and one son survive him.

Miscellany.

MEMORIAL RESOLUTIONS.

THE BOSTON CITY HOSPITAL.

DAVID WILLIAMS CHEEVER, M.D.

The staff of the Boston City Hospital desires to place on record an expression of their great loss in the death of Dr. David W. Cheever. He was one of the original staff of the hospital. To his distinguished service, lasting many years, and to his desire and ability to grasp new ideas in the execution of his professional work, the hospital and the community owe a lasting debt. He was a true pioneer in surgical work.

The several generations of his associates and pupils will always remember his insistence that all his co-workers should maintain the same high standard of careful work which he exacted from himself; yet, with it all, he was a most considerate and courteous master. The staff offers its sincere sympathy to Mrs. Cheever and her children in their great loss.

GEORGE W. GAY,

HENRY JACKSON,

PAUL THORNDIKE.

Committee.

GEORGE HOWARD MALCOLM ROWE, M.D.

Dr. George Howard Malcolm Rowe was the Resident Superintendent and the Chief Executive of the Boston City Hospital for more than a quarter of a century. Those were years of great development at the hospital. Many old departments were enlarged and many new ones were inaugurated, and Dr. Rowe was not only the executor, but he was the inspiration of much of this work. He was recognized the country over as a man learned and wise in all matters pertaining to hospital construction and management, and his advice was widely sought. During the years of his administration he was ever the loyal and devoted servant of the hospital and of the community which maintains it. His active life was terminated only when physical disabilities compelled his retirement.

The Hospital Staff wishes to record its appreciation of Dr. Rowe's unflinching integrity and of his many years of true and devoted effort for the City Hospital, and it wishes to express its sincere sympathy to his sister in her great loss.

GEORGE W. GAY,
HENRY JACKSON,
PAUL THORNDIKE, *Committee.*

NOTICE.

THE AMERICAN MEDICAL GOLFING ASSOCIATION.—In accordance with preliminary announcement made in the *Amer. Med. Asso. Journal* previous to the last American Medical Association convention, the American Medical Golfing Association held its first tournament in San Francisco, June 21, 1915. Arrangements were then made for the organization and that is now complete with the following directors:

President, Wendell C. Phillips, New York; vice-president, James Eaves, San Francisco; secretary-treasurer, Will Walter, Chicago.

Plans are now being made for the second tournament to be held in Detroit at the forthcoming American Medical Association convention in June.

The directors have decided to list as charter members all fellows who shall have enrolled by April 1, 1916.

All fellows of the American Medical Association who play the game are eligible and may obtain the desired information from the Secretary-Treasurer, Dr. Will Walter, 122 S. Michigan Boulevard, Chicago.

Members of the British Medical Association have a similar organization for play at their annual meetings, and it is thought that this will add materially to the social interest of the American Medical Association, as it has to the British Medical Association

SOCIETY NOTICES.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—Adjourned stated meeting at United States Hotel, Boston, Thursday, March 2, 1916, at 11.30 A.M.

Reader: Dr. John D. Adams of Boston, whose paper was postponed from February meeting on account of small attendance.

Subject: "Diagnosis and Treatment of Spinal Affections."

For Dr. John H. Ash, of Quincy.

F. H. MERRIAM, M.D., *Secretary*,
South Braintree, Mass.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-second meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, March 3, 1916, at 8.15 P.M.

The following papers will be read:

1. "The Amount and Duration of Fomites Infection in Diphtheria." Dr. E. H. Place, Dr. H. H. Amiral, Dr. F. D. Jones, Boston.

2. "Spasmodophilia with Especial Reference to Its Treatment." Dr. J. P. Sedgwick, Minneapolis, Minn.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*,
RICHARD M. SMITH, M.D., *Secretary*.

HARVARD MEDICAL SOCIETY.—Historical Club meeting in the Peter Bent Brigham Hospital Amphitheatre, Tuesday evening, March 7, at 8.15 o'clock.

PROGRAM.

"Experiences in a Base Hospital in France." Prof. Joseph M. Flint.

Some letters from the countries at war.

Medical students and physicians are cordially invited to attend.

ERNEST G. GRAY, M.D., *Secretary*.

SUFFOLK DISTRICT MEDICAL SOCIETY.—Surgical Section.—A meeting of the Suffolk District Medical Society will be held at the Medical Library, Wednesday evening, March 8, 1916, at 8.15.

Gall Bladder Surgery. Dr. E. Starr Judd, of Rochester, Minn., will read a paper upon "Cholecystitis with and without Stones." Discussion by Drs. Hugh Williams, W. J. Dodd, D. I. Edsall, E. P. Richardson, A. W. George, Wyman Whittemore, Halsey Loder, Franklin White, and J. D. Bottomley.

JASON MIXER, M.D., *Secretary*.

RECENT DEATHS.

DR. CHARLES W. MORSE, who died recently at Salem, Mass., was born in that city on February 14, 1867, the son of a physician. He received the degree of M.D. from Boston University in 1889 and since that time had practised his profession in his native city.

DR. IVAN PAVLOV, the celebrated physiologist, died recently at Petrograd at the age of 67 years. He was professor of physiology at the Institute of Experimental Medicine at Petrograd. He was the recipient of the Nobel Prize for medicine in 1904.

DR. BENJAMIN F. FICHARDSON, who died of endocarditis on February 15 at Lynn, Mass., was born in Middleton, Mass., on August 23, 1863. He graduated from Phillips Andover Academy and in 1886 received the degree of M.D. from the Harvard Medical School. After pursuing his studies for a time at Berlin and Dublin he returned to the United States in 1888 and since then had practised his profession in Lynn. He was a member of the Massachusetts Medical Society.

DR. SIR WILLIAM TURNER, principal of the University of Edinburgh, died recently in that city at the age of 83 years. He was distinguished as an anatomist and physiologist and was at one time president of the general medical council of Great Britain. He was editor of the *Journal of Anatomy and Physiology*, and author of several works on anatomy and anthropology.

DR. RICHARD HENRY WHITEHEAD who died of pneumonia on February 6, at Charlottesville, Va., was born in 1865. He was Professor of Anatomy and Dean of the Department of Medicine at the University of Virginia.

DR. HENRY BAIRD FAVILL, who died of pneumonia on Feb. 20, at Springfield, Mass., was a noted practitioner of Chicago. He was president of several medical organizations of that city and chairman of Council on Health and Public Sanitation of the American Medical Association.

DR. GEORGE MASON FOSKETT, a Fellow of the Massachusetts Medical Society, died at Worcester, Mass., February 23, aged 59 years. He was a graduate of the University of Vermont College of Medicine, in 1883, joined the Massachusetts Medical Society in that year, from North Dana, and had practised in Worcester for twenty-five years.

DR. DANIEL WEBSTER WIGHT, a retired Fellow of the Massachusetts Medical Society, died at his summer home, Casco, Me., November 20, 1915, aged 78 years. He was a graduate of the Medical School of Maine in 1867, and had practised in Winchester and West Medford, making the latter town his home, for over twenty-five years.

DR. CHARLES CLIFFORD BARROWS, a widely known obstetrician, died at his home in New York recently. He was born at Jackson, Miss., in 1857.

DR. JAMES LLOYD WELLINGTON, who had practised medicine in Swansea, N. H., for 62 years and was the only survivor of the Harvard College Class of 1838 and of the Medical School of 1842, died at his home in Swansea, Feb. 11, at the age of 98 years. He joined The Massachusetts Medical Society in 1846 and was retired in 1883.

The Boston Medical and Surgical Journal

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Address.

FIELD WORK OF THE STATE DEPARTMENT OF HEALTH ON COMMUNICABLE DISEASES.*

By WILLIAM W. WALCOTT, M.D., NATICK, MASS.,

State District Health Officer, South Midland District.

On the Statute Books we find the following: "A local Board of Health may take such action as it may deem necessary to protect the public health."

This statute is capable of very broad interpretation, and it is evident that, barring a military outfit, there is no body of men having the automatic power of a local Board of Health, whether they see fit to use it or abuse it. In dealing with local boards, it is necessary constantly to bear this statute in mind, and to remember that an untrained local board is half child, half savage, and thoroughly human. One of the best examples of an efficient one-man board was found in a small mill town of about 2,000 population. Word was received by telephone that seven or eight cases of typhoid had been reported in this town within about forty-eight hours. The local Board of Health consisted of a mechanical engineer, a mule spinner in the factory, and a livery stable man, and the board had no particular organization. The problem here was to get in touch with the active man and cooperate with him. The

active man in this case was the mechanical engineer,—one of sound common sense, and a real inflexible backbone. It was suggested to this man by telephone that he get together all the physicians in town and the mill superintendent, while I was on my way. A meeting was held by the roadside, and we obtained from the physicians lists of their reported cases and the suspected ones, and the milk supply in each case. I am going into this in more detail in order to give a better idea of the manner in which we have to handle the field work. The reason for having the mill superintendent present was to secure all the information possible in regard to the local water supply. It is not uncommon in mill villages of this type, having town water for the mill, to be equipped with an auxiliary supply from a source of known pollution, which is used for fire purposes only. In this particular case, the fire supply was drawn direct from the Blackstone River—rather high-class sewage. The way this supply situation is handled theoretically is as follows:

When the fire gong rings, one of the mill hands turns a valve, shutting off the town water, and allowing the Blackstone River water to be pumped through the mains, factory as well as household mains. Everyone in town is supposed to know this, and not drink or draw water until the Blackstone River water has been shut off and the town water again turned on. This is handled by means of a check valve, but check valves are usually open to suspicion. What really happened in this case was that there was a fire in the village sixteen or seventeen days before the first typhoid case was reported. This fire took

* Delivered at a special meeting of the Middlesex South District Medical Society on December 15, 1915.

place between 11 and 12 o'clock in the morning, during which time Blackstone River water was pumped direct to every main in town.

When the cases were plotted on a map, it was found that they occurred in the locality where the fire was and where the Blackstone River water was first pumped. Right here we came up against a danger in epidemiological work, that is, of drawing conclusions from insufficient data. So far we had the makings of a perfectly good water-borne outbreak, but as yet the milk supply had not been examined. It is needless to say that any suspicions as to the source of the trouble were not expressed either publicly or privately. The milk supply was next examined with the mechanical engineer. The problem here was simplified, owing to the fact that no milk was shipped in or out of this village. There were six local dealers to be investigated, and the usual questions were asked as to sickness, history of sickness, or history of sickness among the families of milk handlers, or if anyone had recently been employed or discharged. Without exception, they stated that they purchased no milk, and that there was no sickness on any of the premises among the milk handlers, with one exception. The milker on the largest dairy stated that he had been suffering from "dumb" malaria for some time, and a Widal was positive, as were later found the urine and feces. Of the twenty-two cases, with two fatalities, all but six were supplied by this dealer, and on investigating the others, it was found that the dealers supplying the others had, from time to time, borrowed a can or two from this large dealer. In every single case the patient was found to have been supplied with his milk, and the outbreak stopped when the cause was removed, *i. e.*, this typhoid milk handler. While it started with what was apparently a water-borne outbreak, it ended with a well-marked one of the milk variety, and the plotting of the subsequent cases showed that they did not follow the water mains, as they should in a water-borne epidemic, but followed this man's milk route.

This is a good example of a set of conditions where it is particularly important to withhold any opinion, should you happen to have one, or draw any conclusions, until you have collected and studied all the data at hand. It is also a good illustration of the efficiency of a one-man board, where the man in question follows instructions and coöperates actively with the State Health Department through its representative.

One day not long after the typhoid outbreak, word was received to come in a hurry to verify the diagnosis of glanders, made by a local physician. In spite of disregard of traffic regulations, the man was dead before I got there. This story is as follows:

The patient, a milker on one of the tributary supplies of a large dealer, had not been feeling well for two weeks, and had been under the

care of a Christian Scientist. A short time before the man breathed his last, a local physician was called, who arrived in time to make a diagnosis and sign the death certificate. It was the intention to obtain some pus from one of the pustules to verify the diagnosis. Although I arrived but a short time after death, the undertaker, apparently believing the bacilli equipped with efficient motor apparatus, had wrapped the body in cotton soaked with formaldehyde, then wrapped it in a cotton sheet soaked with corrosive, and had it sealed in a casket. In this case, however, we were able to verify the diagnosis by means of one of the cows, and at autopsy, done under the supervision of the Department of Animal Industry, typical lesions were found. The matter was referred to the State Board of Registration in Medicine, but nothing could be done because here we come up against the old problem of "unwilling witness." The unwilling witness in this case was the man's wife, who stated that she had no regrets and would do the same thing again, as it was the deceased's wish, and absolutely refused information in regard to the much-sought healer.

From the many subjects that it is necessary to touch upon in order to give an idea of the field work, it just occurred to me that the title of this talk might better have been "Rambles of a District Health Officer."

The next instance was one of diphtheria. One night about 1 a.m. the telephone rang, and the question was asked why I was allowing diphtheria to be carted all over my district? When the questioner became calm enough to talk coherently, I learned that the parent of the child in a convent school had been requested to take his child home at once. He did this, called his family physician, who found that the child had a well-marked membrane. Inasmuch as there were two other children in the family, this parent was rightly very indignant. The Chairman of the Board of Health in the town where this school was located was instructed by telephone to examine the school at once. On arriving at the town in question, two of the local board met me and we proceeded to the school, where we were met by the Mother Superior, who assured me it was all a mistake, and that it would not happen again. She was told that it would not happen again, but that there seemed to be some question about the accidental part of it. She then said that she did not know about quarantine or did not understand anything about it. To obviate this difficulty, such a quarantine was established and maintained that there no longer exists in her mind any doubt as to the meaning of the word "quarantine." When a question was asked, the Mother Superior would discuss it in French with her subordinates, and after more or less discussion, I was given the expurgated history, but as I understood enough French to get the gist of the matter, I obtained, without any question, more information than

they intended to give. The facts were as follows:

The child had been sick from Monday until Friday, when her father was sent for, and up to the last day or two she had attended her classes, and some of the Sisters in the institution also taught in the parochial school. In short, things were pretty well mixed up. The cultures and clinical meetings showed that 12 cases developed from this one school, two of whom had been sent to their homes in Worcester.

Smallpox is not so rare in Massachusetts as some of us would like to consider it, and some of the severe cases of so-called chickenpox have proved to be smallpox.

In this connection it may be well to say that it sounds all right theoretically to say that we are representatives of the department, and kings on our own little playground, but as a matter of fact, it is not infrequent that the attempt is made, with more or less success, to use us for the goat. After all, this may not be such a bad idea, as it prevents us from taking ourselves too seriously.

On going to see a suspicious case of chickenpox in a co-educational boarding school of about 300 pupils, it was found that the physician's suspicions were correct, and that a Colombian had contracted the disease. He was quarantined in due form and manner, and everyone in the institution vaccinated. As it was near the Christmas holidays, the pupils went to their homes, and notices were sent to the local Board of Health in each of their home towns. As an example of what may occur in a well-vaccinated community, nothing happened; there were no further cases. The Colombian, however, objected to being quarantined, and the authorities told him that of course they would not be so cruel as to shut him up, but that it was all Dr. Walcott's fault,—he made them do it. So the Colombian insisted upon seeing Dr. Walcott. The next day I found the Colombian considerably disturbed,—body, mind and estate. He declared that I had insulted him by suggesting the quarantine; that his honor had been injured, and he wanted my blood and insisted that I fight a duel, giving me the choice of weapons. While I was considering the equipment in my arsenal, he became so offensive that finally I told him I would spank him if he didn't behave himself, and even this didn't satisfy him. He next said that his father was an officer in the Colombian navy, and that he would have his father bring the navy up and get me. I have had the privilege of seeing the Colombian navy, which consists of one little gunboat of shallow draught, so that I guess it would float in a heavy dew. I then explained to him that I lived in Natick, and for him to tell his father that doubtless the Charles River would be navigable for the Colombian navy as far as South Natick, after which point the walking would be good. So you see, field work is not without its dangers.

It may be well to pass over tuberculosis with only a few words, as too much is being said on this subject already. A good many people have seen the statement so many times that tuberculosis can be cured that they absolutely believe it of every case. Now the people whom we want most to reach, as a class think in headlines and read in headlines, and they have seen the headline, and their thinking is stopped there. It is not uncommon for them to believe that they can take "the cure" when they are out of work and there is nothing else to do, but do not like giving up work for it. If they have a winter job, they say, "Oh yes, I will take the treatment in the summer," and the other way about if they have a summer job. Right here use might be made of the keynote of the advertising quack doctor. His advertisement does not read, "My medicine will cure you," but reads more like this, "My medicine will cure you if you take bottle after bottle," and as a bottle often lasts a month, you will find that John Smith has been cured after having taken eighteen bottles. In this way the time element is emphasized, while in the tuberculosis work it may have been emphasized, but to many people it has not been brought home.

A word may be in order about the so-called incorrigible consumptive, and in this connection it is well to speak of the volunteer public health worker, because both may, under certain conditions, become a menace to public health work. We are asked time and time again why something or other is not done to the so-called incorrigible consumptive, and it is a question if there is not sufficient legislation to take care of him, but whether there is or not, the process is complicated, and there are many to be considered. For example, a common type is one who has been discharged from all the State Institutions against advice, and who is now, not only a menace to his family and neighbors, but a general menace, and we want to do something about it. The people involved are, in the first place, the patient himself, the attending physician, the local Board of Health, the State Board of Health, the State Board of Charity, the Trustees of Hospitals for Consumptives, the City Solicitor, the Attorney-General, and if the case goes to court, of course, the Judge and jury. While all this red tape is being unraveled, the incorrigible continues as usual.

Now, coming to the volunteer public health worker, we find she is oftentimes a restless representative of the fair sex, who really has the best intentions, but is entirely without training. Sometimes, and it is usually the case, they are officers in some public health organization. If you will think over the volunteer public health workers you know, I think that you will agree with me that there are plenty of generals, colonels, majors, captains, lieutenants, but sergeants, corporals and enlisted men are in the minority;

in fact, are very rare. In short, they suggest the Central American army, where everyone is a general, or, at least, an officer; and a volunteer public health worker who is not, at least, a sub-committee chairman has no standing in that craft. These workers have a sincere desire to elevate the so-called masses, and expect to do it by an express elevator, with no way-stations. They, apparently, do not realize that many of the people whom they are trying to elevate, do not want to be elevated, and are content to stay on the bottom, where they can't fall off. In disposing of a stock of elevation, a demand must first be created, just as in the case of any commercial commodity you may wish to sell. These volunteers often come with tears in their eyes and voice, and beg to do something for poor, suffering humanity in general, but particularly for the great white plague. The suggestion which is to follow was made in my annual report, but was expurgated, and had I not been given the opportunity of being here today, my rose might have "blushed unseen." The plan is to detail these volunteer workers to the incorrigible consumptives; here they can do no harm, and if they survive this acid test, they will become useful workers whom we can use in other fields. This is practicable, and I tried it in one case of which I will now speak.

The woman in question asked to be enlisted in the fight as a soldier in the army of those fighting the great white plague, so she was detailed to an incorrigible consumptive, and also, by the way, not long after, this man came to me and said, "For the Lord's sake, Doctor, won't you call off that woman?" But he was told that it couldn't be done, and that we knew how to start them, but we didn't know how to stop them. He was puzzled and could not understand it, so I told him maybe his position was like mine one time when I got aboard a burro, who was not much of a linguist, as he understood Spanish only, a knowledge of which had been omitted from my education. Consequently, not understanding English, he went where he pleased, and there was nothing for me to do but to submit a minority report. In a few days the man came back again and he said, "I am on the wagon." When I asked what the matter was, he replied, "I can't even smell a drink without seeing that woman coming." To make a long story short, this man became a model patient, and although he has since died, he died "on the wagon." The woman, on the other hand, is now an able, efficient, active worker, which I think demonstrates a great possibility in volunteer public health workers if they are properly handled.

The next topic is cases that people speak of as the "milder" diseases and do not take them seriously enough, as measles. As you know, measles is pretty hard to control, and whooping cough is also hard. In Massachusetts, from Nov. 1, 1914, to Nov. 1, 1915, there were 6000 reported cases of whooping cough and 237 deaths.

That is too many cases and the death rate is a good deal too high, and, also, that 237 probably does not represent all the death cases,—a good many physicians reporting the contributing cause rather than the primary, and so, some pneumonia, heart cases, etc., should have gone down as whooping cough.

These so-called "mild" diseases can best be handled by educational work, and Professor Gunn of the Division of Hygiene, with lectures and educational work, is filling in this gap.

We now come to "carriers." It has been shown beyond any reasonable doubt that there are "carriers" for diphtheria, typhoid fever, and two or three other diseases. It would seem as if some of the unexplained cases could be explained if we grant that there may be "carriers" for other diseases, and, of late, the study of records, such as scarlet fever, showed where the release from quarantine had been based on the discharges from the ears and nose, there had been a marked decrease in the return cases, and also a decrease in the length of time the patient had to be shut up in the hospital.

There was an example of a typhoid "carrier" in the Worcester Insane Hospital. There were about six cases of typhoid reported inside of a week. We found that all these cases took their meals in one dining-room. We took Widals from all the food handlers. There we found one Widal positive, as were later found the urine and feces, from one of the patients who handled the patients' food. This patient had been an inmate of the institution for about twelve years; had typhoid in 1905, but had been a food handler for only six months. When she was taken away from the food department all the cases stopped.

At this time everyone was immunized, and every new patient or employee is immunized as he enters the institution, so that we have at least one oasis in the state so far as typhoid is concerned.

The problem of diphtheria is entirely different from that of typhoid. In time of outbreaks, when many cultures are taken, from other members of the family, school children, employees, etc., many cultures are obtained from people having no clinical symptoms. Many communities isolate these people for varying lengths of time or until one or more negative cultures have been obtained. Because people who are apparently well have objected to being so quarantined, in some cases the virulence tests are being made. The Department is now making these tests upon request. Inasmuch as in each particular instance, this requires considerable laboratory work, as well as the inoculation of the guinea-pig, the practitioner cannot, as a rule, receive a report from a virulence test inside of six days. Some time ago the Committee of the American Public Health Association on the study and prevention of communicable diseases sent out a questionnaire to 183 cities in the United States, Canada and Mexico, asking about the methods of control of diphtheria and diph-

theria carriers. Eighty-three replies were received. The methods of handling the diphtheria were so varied that it is not worth while to try to tabulate them or go into them here. It may be well, however, to say a word as to the various methods of dealing with "carriers." Of the eighty-three replies received, fifty-six cities treat the carriers exactly as if they were clinical cases. In one or two cities they put a sign over the door, reading "Diphtheria Carrier;" in sixty cities they advise the usual anti-diphtheritic treatment; and only five advise the use of the staphylococcus spray, but this, I believe, may not be without untoward effects. Only three cities make use of the virulence test.

From these figures, as well as conditions with which we are familiar in our own state, it is evident that the diphtheria situation is far from satisfactory.

Dr. Swan asked me to say a word about some fumigation experiments, which Dr. Curtis, Chairman of the Newton Board of Health, and the reader did about five years ago. When the results were published, through some error, Dr. Curtis's name was omitted and the experiments appeared as my own. Just to show that Dr. Curtis was present, I will tell you how the whole thing started:

I went into the office of the Newton Board of Health one morning, when Dr. Curtis said, "Look here, I think Dr. Chapin is right and this fumigation is all rot." So I said, "Well, what are you going to do about it?" To this he replied "I will put my time against yours and will carry on a series of experiments to see whether it is of any use or not."

Through the courtesy of the trustees of the Newton Hospital, and later, through the courtesy of everyone there,—physicians, nurses, house officers, and even the "strangers that were within the gates," we secured the use of two rooms exactly alike for an indefinite period. On looking up the literature on the subject, it was found that most of the experiments had been done under laboratory conditions, with laboratory cultures, and it was our plan to do the experiments as nearly as possible under service conditions. One of the rooms we sealed and fumigated and the other room, which we used for control, we left as it was. We made inoculations upon compresses of cotton, linen, gauze, and sometimes on the wall. Some of these we put on the floor, the table, the chairs, the mantelpiece, window sill, and bed at various locations and elevations. We made similar inoculations, under exactly the same conditions, in the control room.

It was our custom every morning, when we examined cultures after fumigation, to examine those in the fumigated room first, and when it was found that the cultures were dead, and it began to look as though the fumigation had done some good, we would examine the control cultures, and usually found that these cultures had also died,—apparently died a natural death.

We made no use of laboratory cultures because of the possibility of their being attenuated, but for our material took smears and swabs from noses, throats, and ears in the contagious wards, and from suppurating wounds in any of the other wards in the hospital. In this way good, live, virulent organisms were obtained.

A circular letter was sent to boards of health all over the country, asking for their methods of fumigation. Replies were tabulated, and we used every known method of fumigation, for example, sulphur candles, sulphur powder, formaldehyde candles, as well as the apparatus for generating formaldehyde gas from the 40% formaldehyde solution. Potassium permanganate and formaldehyde, at the rate of 1:2 were also used, as well as a mixture of aluminum sulphate, formaldehyde, quicklime and water. Fumigation was carried on for varying lengths of time,—24, 36, 48, and even 72 hours. All the proprietary preparations were also tried under the same conditions. In using the generator for formaldehyde gas, when the attempt was made to force the machine by using more heat, it simply expelled boiling formaldehyde, instead of more gas. In one case of proprietary preparation, where one candle was guaranteed to kill every germ in a given room, we made a little shrine of several of these candles and put the inoculations in the center, and the germs lived happily through the experiment.

These experiments were carried on for nearly a year, and after tabulating the results, the conclusion was reached that gaseous disinfection, as we had carried it out, had no persistent or consistent effects upon the cultures we had used. In other words, fumigation did not fumigate.

In the letter sent to the local boards of health, asking about the methods of fumigation, we found the usual method was to burn a candle or start the formaldehyde generator, and leave instructions with the householder to open the windows after a certain time. This, naturally, did no good, but gave a false sense of security, because oftentimes bedding and other things, which should have been washed or boiled, were simply fumigated. The argument on the other side is that by fumigation we make such an unholy odor that places are aired that never would be under any other conditions.

The city of Newton, being the first one in the state and the second one in New England, Providence being first, promptly made fumigation optional and ceased to do it as a matter of routine. Since that time other cities, such as Boston and New York, have also discontinued it. Philadelphia, I believe, still fumigates for typhoid fever.

It does not seem wise to attempt to cram down people's throats the idea that fumigation does not fumigate, but rather, feed it to them in homeopathic doses, and let them gradually get used to the idea, but making it voluntary. In the meantime, make sure where it is carried out, that it does not replace the good, old-fashioned

yellow soap and water, with plenty of elbow grease. Of course, if the room in which the patient has been ill, can be scrubbed, scoured, painted and papered, that is all that is necessary so far as the room is concerned, but if that is not possible, a good, safe working rule is to scrub with yellow soap and hot water as high as a man can reach. When, finally, fumigation is discontinued, a good many dollars may be spent to much better advantage.

Original Articles.

THE END-RESULTS IN SEVENTY CONSECUTIVE CASES OF UMBILICAL HERNIA OPERATED UPON AT THE MASSACHUSETTS GENERAL HOSPITAL.

BY CHANNING C. SIMMONS, M.D., BOSTON,

Surgeon to Out-Patients, Massachusetts General Hospital; Assistant in Surgery, Harvard Medical School.

THIS report is based on the seventy consecutive cases of umbilical hernia operated upon at the Massachusetts General Hospital between January 1, 1909 and April 1, 1914. The end-result has been obtained in nearly every case. During the last fourteen months of this period I had the opportunity to operate upon all the cases entering the hospital as a special assignment,—fourteen in all. The other fifty-six cases were operated upon by twenty different members of the staff, the largest number done by any one man being seven.

The length of time the cases were followed after operation varies from one to four years. This may seem short, but herniae, if they are going to recur, practically always do so in less than one year from the time of operation, usually in a few months, so that cases remaining well over one year may properly be called cured. In 1910, I reported the end-results of the operations on inguinal hernia in the year 1905, and of the thirteen recurrences in the 146 cases traced, all, when the length of time after operation could be determined, recurred within a year and most in a few months.

For purposes of analysis the cases have been divided into three groups.

Group 1. Small congenital umbilical hernia in children, and small herniae in adults which were operated upon incidentally in the course of another operation, but for which the patient did not seek medical advice. There were 15 cases in this group.

Group 2. The typical cases of large umbilical hernia of slow growth in stout, middle-aged adults, usually women, 43 cases. These cases are all poor subjects for operation. They are

stout and often do not take an anesthetic well. Many of them are also complicated by other hernia, cardiac insufficiency, or pelvic trouble, as prolapse. Thus nineteen of the 43 cases were complicated in some manner. In twelve some other operation was necessary and performed at the same time. Four had cardiac insufficiency, two were ulcerated, two had had previous operations for cure of the hernia, while one had a large goitre. To obtain a cure in these cases the hernia must be attacked in a systematic manner. Infinite pains should be taken to control all hemorrhage and remove all loose fragments of fat that might become necrotic, and to obtain accurate apposition of the parts.

Group 3. Strangulated hernia,—12 cases. Some of these were typical cases of strangulated hernia with congested or gangrenous gut. Several, however, although operated upon as emergencies, might more fittingly be termed irreducible incarcerated herniae. In these cases an attempt at cure was made and in the analysis of the results of operation they have been placed in group 2.

The operations performed may be divided into three main types. (1) The closure of the ring by suture vertically with or without an overlapping of the aponeurosis. (2) Transverse closure of the ring without overlapping of the aponeurosis. (3) Transverse closure with overlapping of the aponeurosis, the Mayo operation. I have always employed the Mayo operation, as yet with no recurrences, and these statistics, although relatively small in numbers, show the advantage of this operation over the others. The ring, which is usually much smaller than the size of the hernia would lead one to suppose, can in nearly every case be closed transversely without tension; while, if the edges are brought together vertically, considerable force is necessary.

I have performed the operations as follows:—An oval transverse incision is made about the umbilicus including the hernia mass. This is carried straight down to the fascia. The mass of fat and hernia is then dissected toward the ring keeping close to the aponeurosis and all hemorrhage from the small perforating veins carefully controlled. By keeping gentle traction on the hernia mass, these can usually be seen and clamped before being cut and the operation in this manner is done almost bloodlessly. The dissection is carried to the edge of the ring and the anatomical structures developed until finally the mass of hernia and fat can be lifted up, being attached to the body only by the sac. The sac is then opened, close to the ring, the contents freed from adhesions and returned to the abdominal cavity or, if omentum, excised. The ring is then closed by the Mayo method, transversely with an overlap from above downwards, by five Pagenstecker mattress sutures. Especial care should be taken in closing the ends of the wound, as it is at this point that recurrence is particularly likely to occur. In some cases the

peritoneum may be closed by a separate stitch, but it is usually impossible, as at the umbilicus the peritoneum is very friable and difficult to differentiate. The free edge of the aponeurosis is caught down with chromic gut sutures and the wound closed with buried catgut sutures in the fat to obliterate the dead spaces. I have had considerable trouble with collections of serum in the loose subcutaneous tissue appearing on about the tenth day. These pockets usually have to be evacuated. Slight skin sepsis is apt to result, with the formation of a sinus which persists for a few weeks. At present I think this is best obviated by a rubber drain introduced to the main wound through a stab wound in the side. It should be left in for five to seven days. After operation the patients are kept in bed for from eighteen to twenty-one days.

RESULTS OF OPERATION.

Group 1. (Children and small herniae in thin adults.) Of the fifteen cases in this group, four could not be traced, and one died of intercurrent disease. Of the remaining ten cases, three adults and seven children, all are well and without recurrence. In one the ring was closed transversely, in three, transversely with an overlap, the Mayo operation, and six were closed vertically. The influence of skin sepsis on recurrence cannot be determined as the two cases in which it occurred have not been traced. Chromic catgut was used as suture material in all but one case.

These cases, although few in number, show that it makes little difference what operation is performed in cases of umbilical hernia in children or small umbilical hernia in thin adults. Cure is always to be expected.

Group 2. (Stout adults.) Of the forty-three cases in this group, two died following operation. One of these (Case 10) died of shock, but as, in this case, the hernia was small, and as a difficult hysterectomy was done at the same time, I have excluded it, as the hysterectomy was obviously the cause of death. The other (Case 16) died suddenly on the table. She was a very stout woman with a systolic murmur and an incarcerated hernia. During operation, ether anesthesia, breathing stopped and the patient died without apparent cause. Autopsy failed to show the cause of death. Mortality one in forty-two or 2.4%.

The result of operation is unknown in two other cases, leaving thirty-nine cases from which conclusions may be drawn. To these I have added six cases of strangulated hernia who survived the operation, in which at the time of operation an attempt was made to cure the hernia.

Of these forty-five cases, in ten the hernia recurred (22.2%), a very large percentage of recurrence. The reason shows on further analysis. Comparing the recurrences with the type of operation performed, in the thirty cases where the Mayo operation was performed, there were

three recurrences, or 10%, while in the fourteen cases where the ring was closed vertically, with or without overlapping of the aponeurosis, six recurred, or 42.8%. The only case closed transversely, without overlapping, recurred.

These cases show the advantage of the Mayo operation, although the percentage of recurrent cases, even after this operation, is larger than it should be.

Eleven of these cases were operated upon by me with no recurrence. One of them, however, classed as a cure, needs special mention,—a case of supposed strangulated hernia, where at operation the acute symptoms were found due to a perforated appendix, situated under the umbilicus. The hernia was closed in the usual manner, and the appendix abscess drained through a right rectus incision. The umbilical hernia has remained cured, but there is a large hernia at the point of drainage of the appendix abscess.

Local sepsis apparently played little part in the recurrent cases, for of thirty-one clean cases, six recurred; while of the fourteen cases in which there was local sepsis three recurred. As to suture material, four of the recurrent cases were sutured with chromic catgut, two with kangaroo tendon, and three with non-absorbable suture material.

The recurrent cases in detail are as follows:

CASE 5. Obese woman 52 years old. Irreducible hernia for years, the size of a grape fruit, for which she wore a truss without relief. Also has a goitre, and a systolic murmur at the apex. Sac contained adherent omentum. Ring closed transversely with kangaroo without overlap. Some superficial sepsis. In bed 18 days. Discharged wearing a supporter. Hernia recurred in ten months following a fall.

CASE 7. An obese woman 29 years old. Small reducible umbilical hernia. She also had diastasis of the recti, and a femoral hernia. Ring closed vertically with chromic catgut and silk. In bed 18 days. Recurrence present at the end of one year.

CASE 11. Obese woman 42 years old. Irreducible umbilical hernia the size of an orange. At operation sac contained adherent omentum. Sac folded in and aponeurosis closed vertically over it with chromic gut. Recurrence present one year later.

CASE 15. Very fat woman 32 years old. Small umbilical hernia reducible with difficulty. At operation, ring closed vertically with chromic gut sutures. Recurred in six months to the size of an orange. Operated upon again and was well one year after second operation.

CASE 19. Obese woman 46 years old. Reducible umbilical hernia the size of an orange. At operation the aponeurosis was closed vertically in two layers with silk, with an overlap. Hematoma of wound followed operation. Two years later there was a large recurrence, causing much pain.

CASE 23. Very fat man 52 years of age. Irreducible umbilical hernia the size of an orange, caus-

ing much pain. At operation the ring was closed by drawing the posterior sheath of the rectus together vertically and the anterior transversely with an overlap. (I have classed this as a Mayo operation). Suture material chromic catgut. Recurred to the size of an orange in six months.

CASE 29. Obese woman 62 years of age. Irreducible umbilical hernia the size of an orange, causing much pain. At operation the ring was closed vertically with overlapping of the aponeurosis, with chromic catgut. One year later there was a recurrence the size of a grape fruit.

CASE 32. Very obese woman 64 years of age. Large ulcerated umbilical hernia. The ring, at operation, was one inch in diameter. It was closed by the Mayo method with Pagenstecher and chromic catgut. Some skin sepsis following operation. Large recurrence at the end of two months, chiefly at the end of the incision.

CASE 34. Female 45 years old. Small reducible umbilical hernia and an epigastric hernia of rather large size. At operation two separate herniae were found. Rings closed transversely without overlapping of the aponeurosis, with kangaroo. One year later the umbilical hernia had recurred.

CASE 209. Obese woman 58 years of age. Umbilical hernia the size of a child's head, strangulated for seven hours. At operation the sac contained viable bowel and omentum. The ring was closed by the Mayo method with Pagenstecher and chromic catgut. One year later there was a large recurrence at the outer end of the scar on the right.

TABLE OF RESULTS—STOUT ADULT CASES.

	Total.	Excluded or Not Traced.	Mortality.	Cures.	Recurrent.	Percent. of Cures.
All cases.....	49	3	1	35	10	78.8
Mayo operation....	30	0	0	27	3	90.0
Other operations..	19	3	1	8	7	53.8

Group 3. (Strangulated hernia.) No particular deductions can be drawn from this group as the numbers are so small and the conditions found at operation so varied. In nine of the twelve cases an attempt was made to cure the hernia. Two of these cases died following operation,—one of pneumonia, a man of seventy-six; and one of probable pulmonary embolism, and one has since died of cirrhosis of the liver. The other six cases have been discussed in Group 2. In the remaining three cases enterotomy was done, and a loop of gangrenous intestine resected. One of these died of peritonitis, but in the other two the fecal fistula was successfully closed at a secondary operation. In one of these the hernia was cured, while in the other it recurred.

DETAILED ANALYSIS OF CASES.

Group 1. There were 15 cases in this group, which may be divided as follows: Children with umbilical hernia of the congenital type, 10

cases. Males 4, females 6. Adults, 5 cases; males 3, females 2. The 15 cases were operated upon by 12 different surgeons.

Children. All were, without doubt, of congenital origin, and with one exception, Case 103, caused no symptoms. This one case had some pain. Eight were described as small and two large (the size of an egg). Four had been treated by strapping, without relief. The children were, as a rule, brought to the hospital by their parents at the advice of the local physician, the parents knowing the defect existed, and wishing it corrected.

In the five adult cases the herniae were all small, caused no symptoms, and were operated upon in the course of some other operation, as follows. One case wished a small hernia cured so he could enter the Army (Case 100). Case 104 was admitted with a strangulated femoral hernia. Case 110 was operated upon for chronic appendicitis, Case 111 for repair of a lacerated cervix and perineum, and Case 112 for inguinal hernia.

Complications. Two cases had slight skin sepsis, 102, 112. In two cases the operation was followed by broncho-pneumonia,—104, 107,—one of these being a case of strangulated femoral hernia, who died sixteen months later of cardio-renal disease. In one case the operation was followed by scarlet fever, Case 101.

Group 2. There are 43 cases in this group. The etiological data are as follows.

There were 7 males and 36 females, 32 of whom had borne children.

The average age was 46.6 years, the youngest being 25 and the oldest 66. Most of the herniae had been present several years, and had been slowly increasing in size.

Thirty cases complained of more or less pain, 5 had no symptoms, and the fact was not noted in 8.

Twenty-one were reducible, one of these *en bloc*, and 19 were adherent and incarcerated, although some of these were partly reducible.

The size may be roughly described as being that of a grape fruit in 8 cases, an orange in 14, a lemon in 7, "small" in 13, and was not noted in one case.

Twelve cases had some other operation performed at the same time, as follows.

Femoral hernia.....	2
Inguinal hernia.....	2
Epigastric hernia.....	1
Repair cervix and perineum.....	4
Chronic appendix removed.....	2
Hysterectomy.....	1

It will be seen that 5 out of the 43 cases had some other form of hernia present, 11.5%.

In most cases the sac was multilocular, and in 14 there were masses of adherent omentum, while 3 contained adherent bowel. In one case the entire cecum, ascending and transverse colon were in the sac. In Case 43 the tumor was reducible, but at operation the sac contained con-

siderable adherent omentum, and reduction consisted of turning it partly inside out. Besides the omentum and bowel, the sac in several cases contained fluid, and the contents presented other evidence of interference with the circulation.

Fourteen cases showed some form of sepsis after operation, one of these cases having phlebitis (Case 8). In two of these cases there was a large ulcer at the time of operation, and a moderate amount of skin sepsis was anticipated. The sepsis was in every case of low grade and very mild, but prevented absolute first intention healing. The wounds healed apparently by primary union, but at the end of from one to two weeks a pocket of serum and "oil" formed under the skin, which necessitated evacuation. Following this, a sinus persisted, which, however, usually closed in a few weeks. In some cases the serum became infected, forming a superficial abscess. In one case (Case 37) several sinuses persisted for three months, at the end of which time a Wassermann was taken, and found positive. Healing occurred promptly after the administration of salvarsan.

Group 3. The 12 cases of strangulated hernia, which were operated upon by 9 different surgeons.

All but one, a case with cirrhosis of the liver, were stout, and all were in elderly adults, the average age being 57 years. The youngest was 44 and the oldest 80. There were two males and ten females.

Seven were described as being the size of a grape fruit and five as that of an orange. In four the hernia had been strangulated previously, and one had had one, and another four, unsuccessful operations performed, the hernia recurring each time. In the other two cases the hernia had been reduced.

The length of time between the onset of symptoms and the operation varied from three hours to two weeks. In five cases the sac contained gut and omentum, viable in every instance; in four cases gut alone, gangrenous in three; and in three cases omentum alone, gangrenous in two instances. The condition of the contents of the hernia, that is, whether it was viable or gangrenous, bore no relation to the length of time the hernia had been irreducible and caused acute symptoms. In Case 211 the gut was gangrenous, although the hernia had been down only seven hours, while in several cases strangulated for from two to four days, the sac contained fluid and engorged omentum or gut, which, however, was perfectly viable.

Complications. Two cases had a cardiac lesion, one a thyroid tumor, one cirrhosis of the liver in an advanced stage, and one diabetes,—7% of sugar. These last two cases were operated upon under spinal anesthesia. Ether was used as an anesthetic in nine cases, and in one enterostomy was performed under local anesthesia.

There were three deaths. One case died on the

second day after operation, a man of 75, of post-operative pneumonia. One case, in which the sac contained ruptured gangrenous gut, died in twelve hours of peritonitis, and one suddenly four weeks after operation, the day after she was discharged from the hospital. This death was due, as far as can be determined, to pulmonary embolism.

CONCLUSIONS.

Small umbilical herniae in thin adults, and umbilical hernia in children, may be cured by any operation which removes the sac and closes the defect in the abdominal wall.

Cases of umbilical hernia in stout adults are difficult to cure. The Mayo operation, of transverse closure of the ring, with an overlap of the aponeurosis, gives the best results.

In adults, closure of the ring by any other method than the Mayo, in a general hospital, is followed by 46.4% of recurrence.

Recurrence, if it is to take place, usually does so in less than one year.

The suture material employed has no relation to the liability to recurrence.

Skin sepsis is very likely to occur, but, apparently has no relation to recurrence.

SOME ELECTROCARDIOGRAPHIC STUDIES OF PATIENTS UNDER DIGITALIS TREATMENT

By HAROLD W. STEVENS, M.D., BOSTON.

THE observations upon this series of patients were made while working as a fourth year student in the medical wards of the Peter Bent Brigham Hospital. Their purpose was to study the variations of the individual electrocardiogram during the course of digitalis treatment and, if possible, to determine which variations may be related with the effect of the drug.

The patients were chosen with regard mainly for the condition that the group include the common types in which digitalis treatment is usually considered as indicated. The group (see tables at end for data of the electrocardiograms, etc., of the cases) contains two cases of auricular fibrillation, two cases of auricular flutter, one case of paroxysmal tachycardia and three cases with normal rhythm, but showing evidence of myocardial weakness. The conditions of observation were such that it did not seem feasible to limit the study to cases receiving digitalis alone. Consequently several of the patients at some time during the period of study received other drugs, none of which, however, is recognized as having any definite cardiac effect. Successive electrocardiographic tracings of individual patients were made as frequently as it seemed that a record would be significant, the intervals varying from one to several days.

The features of the tracings to which special attention has been given are: auricular and ventricular rates; the P-R and R-T intervals; the variations in amplitude of the P, Q, R, S and T waves; variations in form of the P and T waves; and the effects of vagus stimulation. Time periods were measured in 25th seconds, and amplitudes in millimetres, the galvanometer string being each time standardized as nearly as possible so that the recorded deflections in mm. should indicate directly electrical disturbances measured in millivolts. The various measurements have been correlated and tabulated in parallel columns together with the corresponding digitalis medication, (see tables at end).

In accord with one of the commonly recognized effects of digitalis, five of the cases showed decided slowing of the ventricular rate. Of these only one, No. 2111, was a case of normal rhythm. In this instance, during the course of nine days of treatment with the drug, the rate fell from 100 to 70 and remained at about this level for 16 days on three daily doses of digitalis. After reducing the drug to one daily dose the rate rose in 6 days to 90.

The second, case No. 2141, had auricular flutter which persisted throughout the first five days of vigorous treatment, with an auricular rate of about 320 and a ventricular rate of about 80. The tracing made on the sixth day showed both auricle and ventricle beating at a rate of 100. No transition interval of fibrillation was detected. Digitalis was stopped immediately. On the second day the rate had fallen to 85; but on the sixth day after the ending of the digitalis the rate had risen above 100. Digitalis was resumed and continued till the discharge of the patient eight days later, at which time the rate had fallen to 70.

No. 2092, the third of the patients which showed slowing under digitalis, was a case of paroxysmal tachycardia. This patient had a rate of about 250 while in tachycardia. During the night the rate fell to 110. The electrocardiogram taken at about 10 A.M. on the day following the cessation of the tachycardia showed a normal rhythm of a rate about 90. Digitalis was omitted and on the following day the rate had fallen to 70 where it remained approximately during the remaining five days of the patient's stay in the hospital. In how far the slowing of rate from 90 to 70 was the result of digitalis can not be stated definitely. The change from tachycardia to slow rate was probably not a digitalis effect.

The remaining two of the five cases that showed a slowing in rate, No. 2061 and 2081, were both cases of auricular fibrillation with rapid ventricular rates. Both of these showed marked slowing under digitalis and decided increase of the rate following the discontinuance of the drug.

The only instance of slowing of the auricular rate was found in the cases of normal rhythm with rapid rate.

The cases showing no decided change in the rate were a case of paroxysmal fibrillation, No. 2118, and two cases, No. 2257 and No. 2258, both of which were started on the digitalis treatment with a normal rhythm and an approximately normal rate.

All cases in which the auricle and ventricle were beating in normal sequence showed considerable variation in both P-R and R-T intervals. In two of these, 2141 and 2111, there appeared a decided increase of P-R interval corresponding with the period of digitalis treatment; and with discontinuance or diminution of the digitalis, a corresponding shortening of the period. Three of the cases, 2092, 2257 and 2258, showing slight variations, or variations which appear not related to the digitalis, showed also practically no change in the rate over the period during which the P-R interval was measured.

Five of the series, 2061, 2081, 2092, 2111 and 2141, showed an R-T interval gradually increasing over the period of treatment; while two of these, 2061 and 2111, which were observed after the withdrawal of the drug, showed a decrease in the R-T interval which appears to correspond with the time when the effect of the drug should be wearing off. The high and apparently anomalous value for R-T on the first day of case 2257 may possibly be related to the extreme condition of the patient at the time of entry, or to the previous dosage of morphia and adrenalin. The last tracing recorded on patient No. 2111 was made on the day before the death of the patient. The very high values for both P-R and R-T may have been related to the terminal pericarditis, evidence of which was found at autopsy.

A comparison of the variation in P-R and R-T intervals with the corresponding rate change over the same time periods suggests that the variation in these intervals, representing together the length of the heart beats, may be closely related with, or perhaps really a part of, the rate change. As a check on this possibility a study was made of the tracings of several supposedly normal hearts, first while resting, again immediately after violent exercise and then at intervals during the process of return to the normal rate. In all these cases where there was a great increase in the heart rate there was overlapping and distortion of the P and T waves so that accurate comparisons were difficult. However, by using as an index the crests of the P and T waves, it was possible to determine that in these supposedly normal hearts, not under the influence of digitalis, with a markedly increased rate, there was some shortening of the P-R and R-T intervals and hence of the whole length of systole; there could be detected also increase in these periods corresponding to the return to normal rate. In other words, it seems probable that, irrespective of the drug effect, in both normal and abnormal hearts, the length of systole is related directly with the length of the cardiac cycle, though the variations in the duration of

P. B. B. H. Med. No. 2081. Diagnosis: Chronic myocarditis; chronic nephritis; auricular fibrillation.

Date	Digitalis	A rate	V rate	P-R time 50th sec.	R-T time 50th sec.	P	Lead I R S T (in mm.)	Lead II R S T (in mm.)	Lead III R S T (in mm.)	B. Press.	P. Def.
1914											
Dec. 27	Digitalis	folia .1gm	tid.	2 pm							
28	"	"	"	480*	120	13	±.5 7.	-5 ±.5 5.	-1 -5 ±.5 1.	-3 -5 ±.5 160-85	35
30	"	"	"	420*	120	13	9	-1. 8	-1 -1. ±.5 1.	-5 -5 ±.5 28	
31	"	"	"	425*	114	14	12	-2.	6 -1 -1.5 ±.5 1.	-8 -5 ±.5 154-84	10
1915											
Jan. 1	"	"	"	440*	117	14	±1. 14	-2.	9 -1. -2. ±.5 1.	-9 -5 ±.5 110-56	
2	"	"	"	450*	109	16	11	-3 ±.5 11	-1 -2 ±.5 1.	-3. - 144-80	0
3	"	"	"	480*	86	16	±.5 11	-3. ±.5 10	-1 ±.5 1.	-7. - 130-78, Jan 5	5
4	omitted	8pm		420*	92	16	±.5 11	-3 ±.5 11	-2. ±.5 1.	-5 - 130-77, Jan 9	5
8				450*	70	16	±.5 11	-1. -1.8 ±.5 1.	8 -1. 1.	-5 .5 105-50	5
13				440*	84	16	±.5 16	-5 -5 ±.5 6	-1 1. ±.5 1.	-9 1. 115-56	0
14				430*	84	17	±.5 11	.5 ±.5 8	-5 1.5 ±.5 1.	-5 1. 105-50	5
15	Digitalis	folia .05gm	tid.								
16	"	"	"	400*	72	17	±.5 11	-5 .5 ±.5 8	-5 1.5 ±.5 1.	-5 1. 115-56	0

* Approximate rate.

P. B. B. H. Med. No. 2258. Diagnosis: Chronic cardiac valvular disease; mitral insufficiency; cirrhosis of the liver.

Date	Digitalis	A rate	V rate	P-R time 50th sec.	R-T time 50th sec.	P	Lead I R S T (in mm.)	Lead II R S T (in mm.)	Lead III R S T (in mm.)	B. Press.
1915										
Jan 31	Infus. 10cc.	70	70	11	18	1.	8.	1.2 1.2 6.	1. 1. 2.	-2. -1. 155-60
Feb. 1	"	72	72	10	19	.5	5.5	1. 1. 8.	-1. 1. .5 1.5	-1. -1. 140-80
" 2	"	72	72	11	20	1.5	9.	1. 1.5 7.	-1. -1.5 ±.5 1.5	-1.2 -1.5 ±.5 140-80
" 3	"	70	70	10	19	1.2	6.	1.5 1.2 8.	-1.5 ±.5 1.5	-2. -2. ±.5 140-80
" 4	"	71	71	10	18	1.	9.	1.5 1.3 8.9	-1.5 ±.5 1.5	-2. -2. ±.5 140-80
" 5	"	72	72	10	18	1.	9.	1.5 1.3 8.9	-1.5 ±.5 1.5	-2. -2. ±.5 140-80
" 6	"	68	68	12	18	±.5 8.	-1. -1.5 ±.5 8.	-1. -1.5 ±.5 6.	-1. -1.5 ±.5 6.	-2. -2. ±.5 140-80
" 7	"	80	80	12	18	±.5 9.	-1. -1.5 ±.5 9.	-1. -1.5 ±.5 7.	-2. -2. ±.5 7.	-2. -2. ±.5 140-80
" 8	"	76	76	11	17	±.5 10.	-1. -1.5 ±.5 10.	-1. -1.5 ±.5 8.	-2. -2. ±.5 8.	-2. -2. ±.5 140-80
" 9	"	69	69	11	18	±.5 7.	-1. -1.5 ±.5 7.	-1. -1.5 ±.5 6.	-2. -2. ±.5 6.	-2. -2. ±.5 140-80

P. B. B. H. Med. No. 2257. Diagnosis: Syphilitic aortitis; aortic regurgitation; nephritis, chronic (?); hypertension.

Date	Digitalis	A rate	V rate	P-R time 50th sec.	R-T time 50th sec.	P	Lead I R S T (in mm.)	Lead II R S T (in mm.)	Lead III R S T (in mm.)	B. Press.	P. Def.
1915											
Jan. 31	Infusion	84	84	9	18	2.	5.	1.5 1.5 9.5	-2. 3.	1. 3.5 -3.	138-60 (Jan. 30)
Feb. 1	"	72	72	10	16	.5	6.	-1. 1.5 10.	-2. 3.	1. 3.6 -1.5	155-50
" 2	"	72	72	10	17	.5	4.	-5 1. .5 8.6	-1. 1.6	.2 3.7 -1. .5	164-55
" 3	"	71	71	9	18	.5	6	1. 1.5 10.	-1 1.5	.4 2. -4. .2	
" 4	"	67	67	10	18	.5	5	.5 .7 7.	-1 .8	.2 2. -1.5 .2	170-50
" 5	"	67	67	10	20	.5	6.	.5 1. 6.	-1. 1.	1.5 2. -3. -5	
" 6	"	64	64	10	20	.5	5	-5 1. 9.	-2. -1.5	3. -2 -5	170-25
" 7	"	67	67	10	19	.5	6	.5 1. 7.	-1. -1.5	2. -2.5 -5	
" 8	"	67	67	9	18	±.5	5.	±.5 1. 9.	-5 -1.5	2. 1.5 -4. -5	
" 9	"	69	69	8	17	±.5	8.	±.5 1. 10.	-3. -1.5	4. -2.5 -6	
" 10	"	63	63	8	16	±.5	6	±.5 1. 8	-2. -1.5	1. 2. -1. -5	

P. B. B. H. Med. No. 2092. Diagnosis: Paroxysmal tachycardia.

Date	Digitalis	A rate	V rate	P-R time	R-T time	Lead I	Lead II	Lead III	B. Press.	P. Def.
				sec.	sec.	(in mm.)	(in mm.)	(in mm.)		
1914										
Feb.		244	244		7	3. -1.	12.	14.	94-96	
20	15mg 4hr.	244	244		7	1.5	18.	10.		
20	"	240	240		7	2. -1.	12	12		
21	15mg tid	At 6 A.M.	rate fell to 110			tracing taken at 10 A.M. showed normal rhythm.			Tracing lost.	
21	continued	70	70	7	16	1. 2	-1 2.5 9	5.5	-5	
22	"	68	68	7	17	1 3.5	-1.5 2. 9	4.	1.	
23	"	76	76	7	17	1.5 5	-1.5 2.5 9	4.5	1.5	120-86
24	"	70	70	7	17	1.5 6	-1.5 2.5 9	4.5	1.0	114-84
25	"									
26	"	72	72	8	18	1. 5	1.5 2. 9	-1.5 1.	3	-2

P. B. B. H. Med. No. 2111. Diagnosis: Nephritis, chronic; hypertension; chronic myocarditis; pericarditis, acute fibrinous.

Date	Digitalis	A rate	V rate	P-R time	R-T time	Lead I	Lead II	Lead III	B. Press.	P. Def.
				sec.	sec.	(in mm.)	(in mm.)	(in mm.)		
1914										
2	6 P.M. 1 tid								170-110	
3	" " "	100	100	9	16	.5 5.	-1.5 2.5 -1	-1.5 1.5 -4	1.	189-110
4	" " "	94	94	10	16	1 8	1 6. -3.	1. 1. -7	1.5	
6	" " "	90	90	11	16	1 7	1 6 -2	1.5 1 -6	1.	
7	omitted 12 M. infus. 10cc 2 P.M. tid.									
11	" " "	71	71	11	17	1 8 -1	-1.5 1 6 -5	1. 1.5 1.5 -8	1	175-89
15	Discont. "	72	72	11	18	1 8	1 7 -4	2. 1.5 1.5 -8	1	180-110
19	(19) Resumed (27) take 10cc tid	72	72	11	18	.5 5	1 1 4.5 -4	1.5 1 1.5 -7	1.5	220-110 (1-23-16)
28	"	70	70	11	19	1 8	1 2 6.5 -3	1. 1 1 -8.5	1.5	175-80 (1-27-15)
Feb.	" " "	90	90	10	18	1 6.4	1.5 5 -4	1 1.5 2. -5	1.5	
4	(omitted 2-3-16, 11, 2)	90	90	9	17	1.2 7	1.5 4.5 -4.5	1.5 1.5 -6	1.5	185-115
8	"	76	76	12	22	4.	1.5 3. -2	3.5 1.5 -3.5	-1.	

systole are relatively much smaller than those in the corresponding diastolic pause.

Mackenzie¹ states that even a slight increase in the diastolic rest of the heart incident to decrease in rate adds remarkably to the efficiency of its action. Now, entirely apart from increased efficiency due to lengthening the rest period, in accord with principles of mechanics it would appear that with increase of the length of systole there would be a resulting increase in the mechanical advantage of the heart's action and in the work done by the heart. So if we may consider an increase in the length of systole a direct effect of digitalis or even an accompaniment of the slowing of digitalis, we have at least a suggestion of another part of the mechanism through which digitalis increases the heart's efficiency.

Decided variations in wave amplitude appear in some of the tracings. No. 2081 showed in leads I and II a decided increase of R and T waves during the first six days of treatment. The S wave also is considerably increased in lead III. No. 2141 showed an increasing T wave in all three leads. In 2081 the R wave of lead III was increased, corresponding to the

period of digitalis medication; and the T waves in leads I and II showed similar variations.

Diphasic P waves appeared in 2257 and 2258 in all three leads; in 2092 the same was seen in leads I and II; and in 2111 in leads I and II. In all of these cases the transformation was gradual, the waves swinging almost imperceptibly from the usual form into the diphasic, which condition became more or less marked, and in some cases swinging back in the same manner to the original form.

Changes were to be noted in the T wave in a number of the cases such as Cohn, Fraser and Jamieson² have described. No. 2081 showed a T wave at first inverted in all three leads, changing gradually through the diphasic form to become permanently upright. No. 2257 showed a similar transformation, but in the opposite direction; and 2258 the same change in leads I and II. In 2092 the series in all leads began with diphasic T waves which became upright. In 2111 the same changes appeared in leads I and II. No. 2061 in lead III showed a tendency

¹ Cohn, A. E., Fraser, F. R., and Jamieson, R. A.: The Influence of Digitalis on the T Wave of the Human Electrocardiogram, Journal of Exp. Med., 1916, Vol. xxi, p. 593.

² Mackenzie: Diseases of the Heart, London, 1914, p. 377.

toward the diphasic form on two occasions toward the height of the digitalis effect.

Variations in the Q waves were to be detected, in some cases periodic appearance and disappearance of the wave; but in no instances do the changes appear to bear any relation to the effect of the digitalis. The measurements of these waves do not appear in the tables.

In only one case, No. 2061, was the digitalis pushed till the "coupling" effect was obtained. It is interesting to note that on the two occasions when this effect was produced in this patient the complexes of the extra systoles were identical. Also on one occasion while the patient was not receiving the drug a single extra ventricular systole recorded was of the same form as those appearing in the same lead at the height of the digitalis treatment.

Vagus stimulation was tried on several occasions with the patient 2141, a case of auricular flutter. In all cases the stimulation was applied by means of digital pressure; and so could not be absolutely standardized. However, in each case the pressure was carefully applied and was probably approximately uniform. Vagus stimulation at intervals of several days during the course of the digitalis medication produced progressively increased effects in ventricular slowing. On the first of these trials with left vagus pressure, which was found invariably to produce the most effect, it was possible to obtain a blocking of only two ventricular beats with possibly a slight persistent slowing of the auricular rate. Eighteen days later, the time of the last trial, similar pressure produced a ventricular block which would correspond to about seven beats; and a much more marked persistent slowing of the auricle than the first trial.

SUMMARY.

1. The cases in which digitalis produces marked slowing of the heart are cases of abnormally rapid rate; the drug in ordinary doses appears to have little or no effect upon rates which are normal. The ventricular slowing may be produced in cases of normal auriculo-ventricular sequence and in cases of auricular fibrillation and auricular flutter.

2. In some cases of normal rhythm under digitalis treatment there is a distinct increase in the P-R interval; and an accompanying increase in the R-T interval. In some cases of fibrillation also the increase in the R-T interval is found. In most instances these increases are coincident with a decrease in the rate and hence accompany an increase in the length of the whole heart cycle. A possible factor in the improvement of the heart's action under digitalis may be the increased mechanical advantages resulting from the increase in the total length of the cardiac systole.

3. Transformations in both P and T waves appear coincidentally with and apparently related to the digitalis treatment. These variations are, however, not constant.

4. A single case in which digitalis coupling occurred shows, in all instances of the extra systoles, complexes of the same type, indicating a common focus of origin.

5. A single patient showed a much increased susceptibility to slowing by vagus pressure during the digitalis treatment.

EXPLANATION OF TABLES.

In the tabulations of measurements in individual cases—indicates that the deflection was downward; $\pm$ or $\mp$ that it was diphasic, first upward and then downward or first downward and then upward. When no sign precedes the figure this means that the deflection was upward.

THE ABNORMAL PARENT.

By ARTHUR H. RUGGLES, A.M., M.D., PROVIDENCE, R. I.

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FROM the recent contributions to psychiatry we have learned much about personality, symptom-complexes and heredity, but there is one phase of heredity which I think has been insufficiently considered, that is the abnormal parent. The records of a large percentage of nervous and mental cases state that there is no hereditary factor in their present illness. A close examination of one or both of the parents, however, very often reveals conditions which the trained observer at once recognizes as important factors in the causation of disease of the nervous system. While many fathers and mothers of our cases are not and cannot be classed as insane, nevertheless, in very many of the cases one or both exhibit inherent defects of nervous mechanism. These defects result in an imperfect nervous endowment in their offspring and manifest themselves as neuroses and psychoses. These parents, ordinarily classed as not insane, and usually as not nervous, but who upon expert examination reveal well-marked deviations, I have chosen to describe as abnormal parents. It is this subject of the abnormal parent, and its relation to nervous and mental disease, that I wish to consider in this paper. It is my belief that a careful study of the endowment of the parents will lead us to greater accuracy in diagnosis and prognosis of our cases. It will be of the greatest service in furnishing us data to distinguish purely transitory mental states from those more deeply seated ones, which are referable to congenital defect of mental endowment. A better understanding of the morbid states we so often find in the parents of our patients may give valuable evidence concerning practical matters of eugenics, and may serve as a stimulus to more detailed investigation into the various types of abnormal parents, and into the question as to the relationship of these types to certain classes of disease in the offspring.

Anyone who has dealt with the elusive subject of personality, will realize how difficult a task I have undertaken, and agree that a word picture of personality is a most unsatisfactory thing. Indeed, when one attempts to make clear the deviation of a normal personality into the field of the abnormal, it is like trying to draw a word picture of the subconscious or of the fourth dimension.

When I first began to tabulate facts about the patients' parents, I thought I had discovered a parent characteristic of the dementia precox patient, and tried to form a composite picture of such a parent, but soon learned that such parents were not exclusively confined to the dementia precox offspring, and that the dementia precox group was being split up and differentiated too much to warrant such an undertaking.

With our present limited knowledge of abnormal psychology as applied to personality, and without more scientific tests of judgment, insight and emotional reaction, one can do little more than call attention to some of the evident abnormalities in parents of patients suffering with neuroses and psychoses, and must leave for future investigation the different groups of abnormal parents. In our anamnesis we are very prone to ask, "Is there any nervous or mental disease in either of the parents?" No. "Any alcoholism or epilepsy?" No. Then we enter in our family history—"Father and mother alive and well, no history of nervous or mental disease," but when we have spent a few hours with these same parents at our office or on the hospital visiting-days, we realize how far from mentally "well" they are; and it is with the hope that I may in a small measure aid in the study of the peculiarities of these too often recorded "well" fathers and mothers that I have undertaken this work. No doubt if we have the time and patience to make more accurate records of the personality of parents we shall again be brought face to face with the tremendous importance of the defective material of which our patients are made. If this study of the make-up of parents proves to be of real value, it seems to me it will become an important part of the duties of our field workers to meet and study the fathers and mothers of our cases, when they are living, and to investigate as to their make-up, from relatives and friends, when they are not living. It is often found that one parent only is of the abnormal make-up, and in these cases it usually transpires that the patient resembles that parent in both physical and mental characteristics; in other instances both parents will present many, if not all, of the morbid features to be described, and in these cases all children will show deviations from the normal.

No doubt my work will meet with the same criticism that has been made of some of the other investigations into personality, namely, that one should have control cases, that is, a study should be made of parents with children

who are not suffering with neuroses or psychoses, in order to find out what percentage of these parents can be called abnormal. Such a study would be valuable, but would demand more time than I have been able to give, and the difficulties of it are obvious; and I think we shall all agree that individual differences and peculiarities are the rule and not the exception. But it is not with normal differences that I am dealing, but with frankly abnormal ones. If we can show that even a small percentage of our patients are the children of parents, previously not recorded as nervous, peculiar or insane, but who, upon careful observation prove to be of the type I have elected to term "abnormal," we shall have added something to the knowledge of the etiology of mental disease. This study may also help us to recognize some of the abnormal types, so that we may advise against their marriage with others of their kind, or to recognize the pre-psychotic difficulties of adjustment in their offspring. I am quite sure that a study of personality will also lead us to recognize certain individuals who are quite within normal limits, and whose children are assured the heritage of a good nervous system; and, likewise, careful study of the abnormal parents will lead us to recognize types of parents who are prone to have abnormal children.

In certain of the psychoses, we are often met with the question, "Why should my child be insane, there has never been any insanity in the family?" The reply has usually been, "It is one of those conditions for which we as yet know no definite cause," or, "He must have been endowed with a defective nervous system."

I was recently puzzled in a case of dementia precox, to find in my history-taking, that, as far as could be ascertained, both father and mother, as well as several other children, seemed to be quite normal, but more intimate acquaintance proved that the mother was morbidly sensitive, inclined to depression and constant introspection, and that the father was impulsive, stubborn, and egocentric, and that other children were hardly to be classed as normal.

In another case, a psychopath, I learned that the father of the boy had had a mental upset at twenty-three, characterized by fears, indecisions and depression shortly before his marriage, and who, even to this day, has to be "shielded from worry," and to devote several months of each year to regaining his nervous stability after his arduous duties as a teacher in one of our large colleges. In spite of the fact that one of his children was suffering from a mental breakdown, and that two others were described as being less "well poised" than my patient, his marriage was pointed to as a success by his wife, who I think might be fairly accused of having poor judgment, when she was told that her son should not marry.

A third case, whose parents are described as being well, shows upon investigation, the following: A mother, always morbidly sensitive, emo-

tional, lacking in normal insight and judgment, and a father with rather well-marked emotional blunting, always tangled up in a mass of unimportant details, never seeing the evident and important facts directly before him, having frequent periods of marked irritability, and lacking insight into any of his own or the family's limitations.

Still another case that rightly belongs here is one of dementia precox, whose mother is always spoken of as devoted to her children, but who was found to be of the type who never allows her children to mingle with others, always shields them, and never allows them any independence of thought or action,—she herself made few friends and was morbidly sensitive to criticism. The father was a man high in financial affairs, but overbearing in manner, egotistical, obstinate, irritable, and more than moderately alcoholic.

I might multiply these examples from cases that I have personally studied, but these four illustrate some of the trends found in a large percentage of parents of the cases, whose etiological factor is not found in exogenous causes.

These parents are not necessarily lacking in intellectual attainments; in fact are often brilliant along certain lines, but are seldom well-balanced, apt to be egocentric, lacking in a normal degree of insight and judgment, and usually presenting one or more of the following characteristics: emotional instability, lack of power of sustained attention, suggestibility, indecision, morbid fears, jealousies or suspiciousness, given to introspection, seldom taking a broad outlook or seeing the important things of life, but exhibiting an over-conscientiousness, which constantly leads to their entanglement in a mass of petty details. We meet with them in ranks of new cults; they fill our newspapers with letters of complaint; they furnish large numbers of cases for the divorce and bankruptcy courts; they are constantly a little out of adjustment with the normal order of things. These parents are of the type we often hear spoken of by those understanding them best as "peculiar," "queer," or that much abused term, "nervous," but by themselves or their near relatives we are usually told that they are quite normal, and it is by a more careful study in our history-taking that we shall learn of these hereditary factors that play so great a part in making up a large percentage of the neuroses and psychoses.

Some of the parents described, if subjected to present-day mental examination when they were in the third decade, might have been classed as dementia precox cases, if we had had that term, and, undoubtedly, some few did belong in this group. Those cases that might have been so classified were of the type that did not deteriorate seriously, and were, at least in a measure, able to adjust themselves to their environment as they grew older. Others have certain psychasthenic or neurasthenic traits, as the pre-

ceding catalog of symptoms indicates, but they are allied to these conditions rather than typical of them. Most of the parents I have tried to describe could not, indeed, be grouped among the psychoses or neuroses, but were those individuals possessing impaired energy of their nervous system, and their offspring have started life handicapped by an inherited defect in nervous mechanism. A study of these abnormal parents will give us valuable information regarding heredity and a better understanding of the development of the disease processes in our patients.

Clinical Department.

A CASE OF TRAUMATIC FEMORAL ARTERIO-VEINOSUS ANEURYSM.

By EDWARD A. SUPPLE, M.D., BOSTON.

David P., aged 47. Occupation, butcher.

Family History. Negative.

Past History. Negative.

Present Illness. Patient while at work accidentally stabbed himself with a sharp pointed knife in the right groin an inch below Poupart's ligament, just beneath the femoral ring. Profuse hemorrhage followed. Man fainted in his store. Physician called, who checked hemorrhage by tight bandage. Patient removed to his house, where in an hour secondary hemorrhage developed, and was again controlled by a tight bandage. Sent to St. Elizabeth's Hospital in that condition.

Physical Examination. Patient extremely pale, anxious, pulse 120, weak and thready. Bandages removed from thigh, where could be seen a small incised wound about a half inch long, through which was oozing bright red blood. Underneath wound was a small mass size of an English walnut. On palpation a distinct thrill could be felt, and by stethoscope a distinct bruit could be heard. Ecchymosis extended through the entire anterior and lateral aspects of the thigh to the knee. Mass lay in the upper part of Scarpa's triangle, an inch below Poupart's ligament, just over the femoral artery. Owing to the patient's poor condition, and owing to the fact that no hemorrhage was taking place, I decided to wait and watch conditions. Under careful observation, the patient's pulse became stronger and slower, but mass in the groin kept steadily growing larger, with more pronounced thrill and bruit, yet without any active hemorrhage.

Seven days after entrance the mass became the size of an orange, and more fresh blood seemed to be oozing through the wound. Fearing a probable rupture of the mass with fatal hemorrhage, I decided to explore the cause. During all this time a faint pulsation could be felt over the dorsalis pedis artery of this leg. Patient was informed of the extreme danger of the operation and the possibility of an amputation of the leg at the thigh, but consented to allow me to operate. Patient prepared for operation in the usual manner.

Operation. Incision made one inch above and parallel to Poupart's ligament down to peritoneum. Peritoneum peeled back, external iliac artery found

and clamped with rubber tipped clamp. Tourniquet had been placed beforehand, around thigh, above knee. I then made an incision over the femoral artery just beneath the mass, which consisted of a blood clot. Mass dissected away down to the femoral vessels. Owing to profuse venous hemorrhage, in spite of the tourniquet, the femoral vein had to be clamped below the mass. Exploring the vessel, a true arterio-venous aneurysm was found just an inch below the femoral ring. Artery was tied and cut above the aneurysm. To control the venous hemorrhage, I was obliged to tie and cut the femoral vein also. The clamp was taken from the external iliac artery and wound above Poupart's ligament was closed. The tied end of the femoral artery could be seen pulsating underneath the ring and above any one of its branches in the thigh. The wound made over the mass, down to the vessels in Scarpa's triangle, was left open to granulate in, and simply packed with dry gauze. Tourniquet removed and found that all hemorrhages had been controlled. Realizing now that both femoral artery and vein were tied off at the femoral ring, patient was placed in bed, and I expected in a few days to amputate at the thigh, as I felt from the cutting off of the blood supply gangrene would set in. Leg elevated underneath a cradle and heaters placed from ankle to thigh, and treated this way continually. The foot itself never became cold, but no pulsation could be felt anywhere along the leg until the fourteenth day after operation, when a faint pulse could be felt just above the large toe. Patient's general condition improved daily. Wound over Scarpa's triangle healed fast, and patient was able to sit up in a chair four weeks after the operation. Both wounds absolutely healed in six weeks. Patient was able to walk about without any discomfort or lameness. Patient was discharged well, beginning of the seventh week after the operation. At the time of discharge, strong pulsation could be felt over the internal malleolus, and no edema of the foot or leg, even when patient was up and about daily.

Patient seen at frequent intervals after discharge from hospital. Three months after discharge from hospital, patient worked daily at his trade, and, although on his feet the entire day, there has been no edema or swelling of the leg or foot. He is now in perfect physical condition.

Diagnosis. The various x-ray workers seem to be reaching a safer and more conservative point of view than heretofore. A review of the literature on this particular line would seem to show that roentgenologists are coming to realize that the part which the x-ray plays in diagnosis, although a valuable one, is not the only part; that the x-ray simply gives a certain amount of additional information, and that it can never take the place of older and well-tried methods of diagnosis. Giffin and Sheldon,¹ although still claiming too much for the x-ray as a means of diagnosis, wisely call attention to the fact that it is the man who interprets the x-ray plate, rather than the x-ray plate itself, that makes the diagnosis.

The complement fixation test in tuberculosis is coming to be more used than in the past. It is doubtful, however, if it will give any more information, or as much as the tuberculin test already does. McIntosh, Fildes and Radcliffe² believe that the reaction is specific in that a positive result indicates tuberculosis with certain exceptions, and go still further in their claim that a positive reaction indicates active tuberculosis, not merely a tuberculous infection. They qualify this statement by concluding that a positive reaction is "of considerable value." Dr. E. R. Baldwin, who may be regarded as the greatest authority on the subject in this country, would probably confirm this statement that the test is of considerable value.

Rivière³ discusses a new sign and its value in diagnosis. This sign consists of characteristic bands of percussion impairment of constant position, shape and size. These can be found by skilful percussion before any other signs of phthisis and in certain cases before symptoms develop. They do not depend upon structural changes, but are of reflex origin. Rivière belongs to that English school which puts far greater value on percussion than on any other method of physical examination. His observations need to be confirmed before much value can be attached to them.

In differential diagnosis, Landis and Lewis⁴ discuss the question of latent syphilitic infection in the lungs. This is an excellent review of this most important and difficult subject.

Davis,⁵ in an interesting article on streptothrix infections, believes that pulmonary processes due to this cause are more common than is generally supposed, and that such processes cannot always be differentiated clinically from tuberculosis. The organisms are acid and alcohol-fast, but not as acid-proof as the tubercle bacillus. They are relatively non-resistant to anti-formin. Only certain strains are pathogenic to man and beast.

Hawes,⁶ discussing errors in diagnosis of chronic lung diseases, in addition to syphilis, calls attention to new growths, influenza processes and chronic pneumonitis as possible sources of error.

Medical Progress.

PROGRESS IN TUBERCULOSIS.

By JOHN B. HAWES, 2d, M.D., BOSTON.

AND

P. CHALLIS BARTLETT, M.D., BOSTON.

THERE have been no striking developments in diagnosis, prognosis, or treatment of tuberculosis during the past year. What has been accomplished is more in the way of giving emphasis to physicians and to the laity to already well known facts and methods, rather than of demonstrating anything new.

Peers⁷ emphasizes the frequency of tuberculosis as the cause of symptoms of all kinds. He urges that in every obscure medical case, the physician should at least consider tuberculosis as a possibility, and that one or two negative sputum examinations should not entirely rule it out. On the other hand, he states that a positive tuberculin test does not necessarily mean that the patient needs treatment. This is a wise remark.

Townsend⁸ has contributed a good general article on early diagnosis. Ford⁹ discusses the lack of early diagnosis and makes the statement, which is unfortunately only too true, that the average general practitioner does not know how to diagnose pulmonary tuberculosis. He blames the medical schools for this, in that this subject is not given sufficient attention.

Klotz¹⁰ in an excellent article discusses the so-called Kroenig's isthmus and its value in diagnosis. He concludes that unless the disparity of the apical percussion field as expressed in terms of Kroenig's isthmus is very marked, it does not necessarily point toward tuberculosis on the corresponding side, that such disparity is of much less significance on the right side than it is on the left, and that in most instances the disparity of the apical percussion fields is simply due to anatomical changes not relative to tuberculosis. It is high time that these conclusions should be reached. Much time is wasted by physicians and medical students in endeavoring to find one or two centimeters' difference between the bands of resonance at each apex, and much harm is done by deducing certain things from such differences.

Brown¹¹ and Hawes¹² in separate articles have presented the subject of early diagnosis of tuberculosis in succinct and almost diagrammatic form. These articles are of value to the general practitioner, who rarely has time or inclination to read or digest longer and more detailed discussions on the subject. Hamman¹³ has likewise written an excellent article on early diagnosis.

Treatment. Tuberculin is coming to be used more in non-pulmonary forms of tuberculosis and somewhat less in the pulmonary forms. Litzner,¹⁴ discussing focal reaction in a tuberculin test, warns against the use of tuberculin in ambulatory treatment where there is marked focal without a general reaction. Crofton¹⁵ urges prophylactic inoculation against tuberculosis in families where there has been marked exposure to the disease. He believes that a short course in tuberculin is of great value in preventing later development of tuberculous disease. Peters,¹⁶ discussing the value of tuberculin, states as follows: "As yet we have no specific for tuberculosis, and neither tuberculin nor any other factor in the treatment of this disease will raise the dead consumptive. Yet I feel that conscientious and careful use makes tuberculin an agent for great good." If he added to this statement conscientious and careful use "in a sanato-

rium where the patient is under absolute supervision," his conclusion would be of still greater value.

Peters¹⁷ uses blood pressures as a guide to exercise. When a patient shows a drop of six or more millimeters after he has had a rest following his exercise, or a marked drop on returning from exercise, he believes that the patient has done too much. If he has only a slight drop, he repeats what the patient is already doing until an even standard is maintained, when it is again increased. His observations should be confirmed. If they are found to be correct, this will give a valuable gauge whereby to measure the amount of exercise a patient should take.

Hawes¹⁸ takes up the subject of tuberculosis in elderly persons as to diagnosis and treatment. He is unable to confirm Stoll's¹⁹ statement that a positive d'Espine sign in elderly persons means tuberculosis rather than a chronic bronchitis. He calls attention to the fact that elderly persons rarely react well to the strict régime of sanatorium life.

Tuberculosis in Childhood. Park,²⁰ of the New York Health Department, discusses the transmission of tuberculosis in childhood, particularly with reference to tuberculous milk in New York City. Frazer²¹ considers tuberculosis a true children's disease, and although presenting nothing new, reviews the diagnosis of this condition in childhood. Howell²² has made a careful study of the signs and symptoms of enlargement of the bronchial glands. He emphasizes the fact that such enlarged glands are not necessarily tuberculous. This is an important point and it should be constantly borne in mind. Rieha²³ urges that prophylaxis take precedence over treatment in tuberculosis work in children. Pollock²⁴ describes the measures which should be taken from the broad administrative point of view to control tuberculous infection in early life. Stoll¹⁹ discusses the value of the d'Espine sign. He again emphasizes the fact that the presence of this sign means enlarged bronchial glands, but that these glands are not necessarily tuberculous. Its presence in a delicate child is suggestive of tuberculosis, but not necessarily conclusive. In elderly persons a positive d'Espine sign speaks for tuberculosis rather than for a chronic bronchitis. This latter statement has not been confirmed, nor does it seem to rest upon any sound pathological basis. Garvin²⁵ discusses tuberculous infection in childhood. Whether or not the individual will develop pulmonary disease in later life depends upon the quality and quantity of his first infection in early life.

The fundamental thought in prophylaxis must be directed to the child and to his family and home surroundings. The next important point of any tuberculosis campaign should be directed against those factors which will cause a later infection with the germs already present. Cat-termoie,²⁶ basing his work on a large number of

tuberculin tests on children in Colorado, discusses the general question of tuberculous infection in childhood. Woodruff,²⁷ discussing the tuberculous child, emphasizes the value of rest and exercise in proper proportions and the need of prolonged treatment after the child has left the sanatorium or has ceased to be under absolute supervision.

Non-Pulmonary Tuberculosis. Gage²⁸ presents a careful study of acute tuberculous inflammation of the ileocolic glands simulating acute appendicitis. Kisley²⁹ considers the same subject. Acute inflammation or enlargement of tuberculous mesenteric or retro-peritoneal glands often simulates acute appendicitis. It may be impossible to make a correct pre-operative diagnosis in these cases. Many people, however, have such enlarged glands with symptoms. They are usually in two types, the chronic and the acute fulminating. Hawes³⁰ has reviewed the cases at the Massachusetts General Hospital and made a careful study of the signs and symptoms of this condition.

Burnham³¹ believes that tuberculin, especially sensitized B. E., is of great value in various forms of surgical tuberculosis, and should be used in dispensaries and elsewhere where a sanatorium régime is not possible. It is evident that this is coming to be the opinion held everywhere in this country. It is important, however, to remember that tuberculin alone is not the chief factor, but that tuberculin, good hygienic treatment, and wise and conservative surgery each must play its part in the treatment of non-pulmonary tuberculous disease. The profession, and especially the surgeons, are coming at last to realize that tuberculosis, whether in the lungs or elsewhere, is always the same, and that the treatment should be directed to the patient who has the disease rather than to the disease itself.

Artificial Pneumothorax. One notes with pleasure and relief that artificial pneumothorax is at last finding its proper position in the treatment of pulmonary tuberculosis. It has been through the stage when it was hailed as a cure for all forms of phthisis. While there are still a few hyperenthusiasts yet maintaining this position, the great majority of the profession realizes that it plays only a comparatively small part in treatment.

Jacot³² describes a number of cases of purulent pleurisy complicating artificial pneumothorax. Lapham³³ finds that 20% of the cases of pneumothorax which she discusses developed pleurisy subsequent to this procedure.

Woodcock³⁴ discusses the dangers of artificial pneumothorax and comes to well and sane conclusions. Bullock and Twitchell,³⁵ in an excellent article on the exudates in pneumothorax, urge that this treatment be employed in carefully selected cases only and where sanatorium and climatic treatment can likewise be employed.

Sloan and Hamman³⁶ report their results in the use of artificial pneumothorax during the

past four years. The induced pneumothorax treatment applied to 40 patients with moderately advanced tuberculosis, 4 with advanced pulmonary disease, and 1 with bronchiectasis, influenced the progressing course of the disease little or not at all in 60%. It did cause temporary improvement in a number of these cases, and to a small number has brought about perfect health and complete working capacity for two and one-half years.

Pathological and Bacteriological. Hart³⁷ discusses the factors which coöperate in producing tuberculous apical lesions. He presents many arguments to prove his claims in regard to the mechanical predisposition to the apical lesions because of the closure of the superior aperture. He describes cases where on autopsy marked anthracosis, but no signs of tuberculosis, was found at the apices. In these cases, whether tuberculosis was present or not, there was always something abnormal in the apical aperture preventing the free ventilation of this region.

Gilbert and Gregg³⁸ discuss the virulence of various strains of human tubercle bacilli. The use of living bacilli for the production of immunity has been of little avail because of our inability to control the exact number and the virulence of the bacilli. Their work goes to show the great variation in the lethal dose of different virulent cultures. Petroff³⁹ has made a distinct advance in the methods of growing the tubercle bacillus by the introduction of his new medium. This medium contains one part of meat juice, two parts of egg, white and yolk, gentian violet sufficient to make a solution of 1:10,000.

Austrian and Hamman,⁴⁰ in their investigations of tubercle bacilli in circulating blood, were unable to demonstrate the presence of tubercle bacilli in the blood in a single instance, notwithstanding the fact that many of the patients when examined were in the last stages of the disease. This statement, coming from such a source, is worthy of most serious consideration.

Baldwin,⁴¹ discussing immunity in tuberculosis, believes that the ultimate survival of those who acquire a relative immunity against the disease will tend to diminish the severity, but that many generations may be required to accomplish this. The opportunities for infection, now universal in cities, will diminish gradually in civilized lands by lessening the danger from advanced cases as well as from bovine sources. For many years, however, "the number of carriers will increase owing to the improved care, longer life, and higher standards of living among the people." As time goes on, the amount and frequency of severe infections, however, will diminish, while the number of those with slight harmless infections should relatively increase.

Sociological. Way⁴² calls attention to the importance of tuberculosis carriers and to the need of careful examination of all members of every family in which there is a known case of pul-

monary tuberculosis. The trained tuberculous subject, however, who knows how properly to dispose of his sputum and has a sufficiently aroused private and personal as well as an educated public health conscience to compel his taking proper precautions, should be free to come and go as he wills without let or hindrance, as his danger to others lies where he can almost wholly control it. This is a sane remark.

Undoubtedly as a result of the educational campaign which has been waged so constantly for the past ten years, there is developing a recrudescence of phthisiophobia which does injustice in many instances.

Stone,⁴³ in a good article, describes the policy of the State of Massachusetts in regard to the tuberculosis problem. Massachusetts is still, like other states, devoting its attention to segregation of consumptives and protection of the public; its real sanatorium work is, unfortunately, more in fact than in name. With the establishment of local tuberculosis dispensaries in every city or town of 10,000 inhabitants or over, and with the steady increase of local tuberculosis hospitals, he believes that the time is not far distant when the state sanatoria can devote themselves to the treatment of incipient and early cases.

Hawes⁴⁴ urges that the medical profession and local authorities devote more time and assume more responsibility toward the discharged sanatorium patient. Many relapses would be prevented were this done.

White⁴⁵ states as his belief that "any given unit of population occupying any given territory, no matter how small the unit, that can demonstrate the accomplished control of this disease will solve the problem for the whole nation." He presents a working plan whereby for each 100,000 of population there should be a hospital of 200 beds, a dispensary, an open air school, 15 nurses (of whom 5 are visiting social service nurses), and four or five physicians.

Sachs,⁴⁶ discussing the official responsibility of the city in the tuberculosis problem, has many good suggestions to make. Efficiency in this work calls for "united effort with centralization of authority."

Laryngeal Tuberculosis. Levy,⁴⁷ discussing the treatment of laryngeal tuberculosis, urges conservative treatment in early and moderately advanced cases, but that occasionally in the later stages of the disease operative measures are best.

Heliotherapy. The development of heliotherapy so that it can be carried out in private form outside of sanatoria, and in climates and localities which were formerly considered unsuited for its use, marks one of the greatest steps in the progress of this year.

Twiehell,⁴⁸ in a most interesting article, describes the effects of the sun's rays on experimental tuberculosis in guinea-pigs and rabbits. In some cases the tubercle bacilli were actually killed, and in others they were restrained in

their growth by direct exposure to the sun's rays.

Rubow and Würtzen⁴⁹ report favorable results with the use of phototherapy in pulmonary disease. Instead of direct sunlight, they use the Finsen rays, exposing the body gradually, as is done in cases where the sun's rays alone are used. They urge that this method be given further trial.

Schäffer⁵⁰ describes heliotherapy as used in Denmark. He states that as long ago as 1902, sun baths were introduced as part of the routine treatment of lung and bone tuberculosis. The duration of these baths is only five or ten minutes at first, gradually increasing up to an hour. This method was never used on the patients with a tendency to hemoptysis or in progressing pulmonary lesions. He reports favorable results.

Prognosis. Metzger and Watson⁵¹ describe their work under urochromogen reaction. They believe that its presence in a tuberculous patient is of unfavorable import. Its persistence means a hopeless prognosis, while its absence is a good sign.

Miscellaneous. Pettit⁵² discusses traumatism as an etiological factor in pulmonary tuberculosis. This is an excellent article with numerous references. Trauma is never a primary cause of tuberculosis. If we believe it to be a secondary cause, the other factors which commonly contribute to the development of tuberculosis must be excluded. "For medico-legal cases the complexities of the situation are so great as to make it almost, if not quite, impossible to determine how far trauma is ever a contributory factor in the development of tuberculosis."

This statement, although undoubtedly true, is not, however, the opinion generally held by the courts. The court is not dealing with things which may be the possible cause of the development of tuberculosis, but with factors which may be a probable cause of its development. In Massachusetts, at least, this has certainly been the ground held by the Industrial Accident Board in awarding damages to plaintiffs who develop tuberculosis subsequent to an injury. Each case, of course, must be decided on its own merits, and the development of the tuberculosis must bear a definite relation in time and in other ways to the alleged injury.

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Reports of Societies.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.

A special meeting of the Middlesex South District Medical Society was held in the Boston Medical Library at noon, on Wednesday, December 15, 1915. DR. WILLIAM W. WALCOTT, district health officer of the Massachusetts State Department of Health, presented a paper on "Field Work of the State Department of Health on Communicable Diseases." The discussion was opened by DR. EUGENE R. KELLY, director of the Division of Communicable Diseases of the Massachusetts State Department of Health.

* See JOURNAL, page 337.

Book Reviews.

The Starvation Treatment of Diabetes, with a Series of Graduated Diets as Used at the Massachusetts General Hospital. By LEWIS WEBB HILL, M.D., and RENA S. ECKMAN (Dietitian). With an introduction by RICHARD C. CABOT, M.D. Boston: W. M. Leonard. 1916.

The first edition of this convenient manual of the newer treatment of diabetes was reviewed in the issue of the JOURNAL for October 7, 1915 (Vol. clxxiii, page 551). The appearance of this second edition within so short a time is evidence of the merited success which the work has met. This second edition has been revised and enlarged to twice the size of the first. The technique of the treatment has been rewritten and facts learned in clinical experience for the past few months have been emphasized. A series of case histories, both of adults and of children, treated at the Massachusetts General and Children's Hospitals has been added, with charts representing graphically the course of progress during starvation and particularly during subsequent dietetic treatment. A section or recipes for diabetics has been added and the list of daily diets has been much enlarged and revised. There is a progressive diet list up to the fifteenth day after starvation and a new and fairly complete table of food values in form for ready reference. It is obvious that the original value of the book is much increased in this new edition, the continued success of which should be correspondingly prompt and definitive.

Manual of Surgery. For Students and Physicians. By FRANCIS T. STEWART, M.D., Professor of Clinical Surgery, Jefferson Medical College; Surgeon to the Germantown Hospital; Out-Patient Surgeon to the Pennsylvania Hospital. Fourth Edition, with 580 Illustrations. Philadelphia: P. Blakiston's Son & Co. 1915.

Dr. Stewart's Manual which first appeared in 1907, has deservedly achieved a fourth edition. Much new matter has been added and many changes inserted. The book is now a moderate sized volume of not more than 700 pages; the type is clear, the paper flat, and the illustrations good. For so small a book, it contains a surprising amount of reliable information. It reflects the views of a surgeon who, though still young, has enjoyed an extraordinarily large operative experience. It is primarily practical, and stripped of every unessential. It is a real text-book, not a compendium. The author's own technique of operation for cancer of the breast is included. The book continues to make a most favorable impression. It is strongly recommended to students.

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SOME VIEWS CONCERNING THE UNITED STATES ARMY MEDICAL CORPS.

To the physician interested in his country's welfare, no more interesting reading can be found than the report of the hearing before the Committee on Military Affairs of the National House of Representatives (Jan. 21 and 28, and Feb. 1, 1916). The subject of the hearing was "To increase the efficiency of the military establishment of the United States," and of the four hundred odd pages of the report, more than one-third dealt with the army medical corps. A number of medical men representing national and state societies testified, but the true inwardness of the situation was contained in the testimony of Surgeon-General Gorgas, who went at considerable length into the function of the army medical corps, its present condition and its needs. He submitted also the report of a French commission who had investigated the

conditions responsible for the "decompensation" of the French medical service at the beginning of the war.

Our army medical corps at present consists of 443 medical officers, 91 officers of the medical reserve corps and 15 contract surgeons. Our army numbers 92,973 men, thus giving a ratio of 0.59 of 1%. The British ratio is about 1%. General Gorgas asks that the number be increased from 443 to 980, and estimates that for an army of 200,000 engaged in active service, the number of medical officers required for all purposes would be around 2500. The United States has medical stores packed and ready for immediate shipment, for 250,000 to 300,000 men.

In reply to questions about the medical reserve corps, the Surgeon-General said he considered the plan to be working out in a very satisfactory way, there being now 1460 members, of whom 200 went last year to instruction camps, while 700 are taking the four-year correspondence course offered by the army.

Several of those who testified advised an increase in the pay and in the rank of officers of the medical corps. This they thought necessary in order to obtain good men. As was pointed out, of late years the opportunities for doctors in civil practice have improved. The relative number of medical graduates in civil life has decreased 47% between the years 1904 and 1915. In other words, there is now one doctor to every 28,000 people, whereas in 1904 there was one to every 14,000. Physicians, therefore, are less likely to heed the call of service under the government. In answer to the criticism that in times of peace a larger medical corps would have no work to do, General Gorgas predicted a wider sphere of usefulness than would be found in purely military affairs. Research, public health and sanitation are fields in which those not needed for the army could be employed to good purpose.

One not infrequently hears it said that, in case of war, civil surgeons could very quickly assume the duties of army surgeons, and, aided perhaps by railroad and executive officers and the comparatively few medical officers of the regular army, could meet the problems of caring for the wounded successfully. So far as the actual surgical treatment of wounds is concerned, this is true. But as Dr. Rodman, president of the American Medical Association, said in his testimony, "I went into the army as a

contract surgeon in 1880 and served for 17 months. . . The strictly professional part of my work was the easiest part of what I had to do." Without doubt, hospital units for base hospitals, composed of carefully selected civil surgeons, would be of great value. A glance at the list of duties of the army medical corps, however, will show the need for special training. As given in the Surgeon-General's report to the chairman of the Committee on Military Affairs, House of Representatives, these are:

a. Professional care of the sick and wounded in garrison, on the march, in camp, on the battlefield, and after removal therefrom.

b. Investigating the sanitary conditions of the army and making recommendations in reference thereto, including the location of permanent camps and posts, the adoption of systems of water supply and purifications, and the disposal of wastes.

c. Making physical examinations of officers and enlisted men.

d. The management and control of military hospitals.

e. The recruitment, instruction and control of the hospital corps and the army nurse corps.

f. Furnishing all medical and hospital supplies.

g. The direction and execution of all measures of public health among the inhabitants of occupied territory.

h. The methodical disposition of the sick and wounded, so as to insure the retention of those effective and to relieve the fighting force of the non-effective.

i. The transportation of the sick and wounded.

j. The establishment of aid stations, dressing stations, hospitals, and other formations for the care of the sick and wounded.

k. The preparation and preservation of individual records of sickness and injury in order that claims may be adjudicated with justice to the government and to the individual.

l. The instruction of the troops in personal hygiene.

m. In addition to these duties, specifically prescribed, medical officers are required to act as members of retiring boards, examining boards, and courts-martial, and as instructors for the organized militia.

How many of us could, without special training, discharge these duties successfully?

AN IMPORTANT LEGAL DECISION.

THE bench of the supreme court of Wisconsin has recently afforded further arguments on the question whether diseases caused by conditions arising in the course of employment are to be interpreted as the result of accidents, under the terms of the workmen's compensation laws.

In the case at instance, an employee had died of typhoid fever contracted by drinking impure water furnished by the employer. The court decided that the death was the result of an accident, and that the employer was liable. The plaintiff filed a demurrer to the original decision of the district court, the circuit court ordered the demurrer overruled, and appeal was made to the supreme court, which affirmed the order appealed from. In rendering this decision, Justice Siebecker, as quoted in the weekly report of the United States Public Health Service, stated his opinion in part as follows:

"The inquiry is: Was the disease from which it is alleged Vennen died proximately caused by accident? Do the facts and circumstances alleged in the case set forth the conditions to entitle an employee to compensation 'for any personal injury accidentally sustained,' which was 'proximately caused by accident' while 'performing services growing out of and incidental to his employment'? We have already noticed that the alleged injury was, under the facts stated in the pleadings, received by deceased while in plaintiff's employ and while he was 'performing services growing out of and incidental to his employment.' Whether or not the alleged accidental injury, caused Vennen's death is sufficiently pleaded, and remains a question for determination from the evidence at the inquest of the case. There remains the important inquiry: Do the allegations state a case showing that Vennen's death is attributable to 'accident' in the sense of the compensation act? It is urged that the contracting of typhoid disease under the facts and circumstances stated does not show that his death was due to an accidental occurrence. The term 'accidental,' as used in compensation laws, denotes something unusual, unexpected, and undesigned. The nature of it implies that there was an external act or occurrence which caused the personal injury or death of the employee. It contemplates an event not within one's foresight and expectation, resulting in a mishap causing injury to the employee. Such an occurrence may be due to purely accidental causes, or it may be due to oversight and negligence.

"The fact that deceased became afflicted with typhoid fever while in defendant's service would not, in the sense of the statute, constitute a charge that he sustained an accidental injury, but the allegations go further, and state that this

typhoid affliction is attributable to the undesigned and unexpected occurrence of the presence of bacteria in the drinking water furnished him by the defendant, as an incident to his employment. These facts and circumstances clearly charge that Vennen's sickness was the result of an unintended and unexpected mishap incident to his employment. These allegations fulfil the requirement of the statute that the drinking of the polluted water by the deceased was an accidental occurrence while he was 'performing services growing out of and incidental to his employment.' It is alleged that the consequences of this alleged accident resulted in afflicting Vennen with typhoid disease, which caused his death.

"The cases wherein liability has been found distinguish between disease resulting from accidental injury and disease which results from an idiopathic condition of the system, and not attributable to some accidental agency growing out of the employment. The latter class of diseases are held not to be within the contemplation of the act. We are of the opinion that the decision of the trial court, holding that the facts pleaded show that Vennen's death was caused by accident while performing service growing out of and incidental to his employment, is correct, and that the demurrer was properly overruled."

Justice Barnes of the same court, however, filed a dissenting opinion, in which he stated, in part as follows, the essence of his views on the subject of the interpretation of the act:

"By Section 2394-3 liability exists under the compensation act where employer and employee are under it: (1) For 'any personal injury accidentally sustained' by the employee while 'performing service growing out of and incidental to his employment, . . . where the injury is proximately caused by accident and is not intentionally self-inflicted'; and (2) for death where the employee is performing such service and where the injury causing death is 'proximately caused by accident,' and not intentionally self-inflicted. To justify recovery under this statute, where death does not ensue, there must be a personal injury actually sustained, which injury is proximately caused by accident. Where recovery is sought for death, the statute does not in express terms say that a personal injury must actually be sustained, but only that there must be an injury 'caused by accident.'"

"The peculiar concern of this court is to get at the legislative intent. When the court ascertains that intent, it has not only performed its full duty, but has exhausted its legitimate powers. It has no right to curtail or extend the provisions of any statute. The compensation act as now construed by the court will, I think, add

materially to the liabilities popularly supposed to exist under the act, if it does not double them. If the legislature so intended, well and good. I cannot bring myself to believe that it did so intend.

"It is a matter of common knowledge that cases of sickness and disease are much more numerous than cases of what are commonly known as accidents. The compensation act was passed after an exhaustive study of the subject of industrial insurance by a committee of the legislature, which covered a period of two years. There were two classes of acts in operation in other jurisdictions—one covering diseases and accidents; the others not, in terms at least, covering disease. If it had been the purpose of the legislature to include the large class of cases that would result from sickness, it is fair to presume that it would have done so in express and unmistakable terms.

"The law was an optional one, and is so yet. As was expected, there was a great deal of hesitancy on the part of employers about coming under it. Had it been supposed that it provided compensation for disease or sickness, it is probable that the purpose of the law would have been practically nullified. The effect of the decision in this case is, of course, conjectural, but it is not without the range of possibilities that some at least of those who are now under the act will exercise their election not to remain under it. It is now a generally accepted truism that many diseases attack those who are physically weak and run-down rather than those who are strong and able to throw off unwelcome disease germs. The weak must work as well as the strong, or else be taken care of by the public, and, should they be discriminated against in the matter of securing employment, much harm would follow. The question whether we should or should not have insurance against sickness is one of legislative policy. The manner of paying such insurance, if decided upon, is also a question of legislative policy within constitutional limits. I do not question the power of the legislature to pass an option law, such as we have providing for indemnity against disease. What I do say is that the legislature has not done so, and that the act passed has been stretched by construction so as to add to it in all probability as large a class of claims and liabilities as that actually included in the original act."

It is as difficult a matter to decide between dissentient judges as between the proverbial doctors who disagree. The arguments of both sides are well stated. Probably the mere fact of the disagreement is evidence, as in the case of Sir Roger de Coverley, or, indeed, of most subjects of human discussion, that there is much to be said on both sides.

MASSACHUSETTS GENERAL HOSPITAL.

THE trustees of the Massachusetts General Hospital have recently published in two volumes their one hundred and second annual report, including the General Hospital in Boston, the McLean Hospital and the Convalescent Hospital in Waverley. The report covers the work of these institutions for the calendar year 1915. During this period the total number of patients treated in different department of the General Hospital was 7898, as against 7741 in 1914. There were 29,213 new cases in the out-patient service.

Particular reference is made to the beginning of the new administration building on Fruit Street. Other new activities and needs of the hospital are outlined in part as follows in the report of the administrator, Dr. F. C. Washburn:

"One of the pressing needs is a country branch where we can move bed patients for convalescence. The land for such an institution is now owned by the hospital. It is a beautiful situation upon a hill on the Concord turnpike in Belmont in the rear of the land at McLean Hospital.

"A hospital for the care of people of moderate means should be erected in connection with the General Hospital for patients who should pay something to the physicians for their medical and surgical care, but who are unable to pay the full price for care in the new private ward which we are building. I would make an urgent appeal to the generosity of the community for a special gift to erect a building for this object.

"A building for children should be erected in connection with the General Hospital. The children's medical department has but seven cribs for bed patients, and these are in an unsuitable location. The need for a building for children is very considerable. It should be distinct from the buildings for adults, as the problem in the care of children—the ease with which they contract contagious diseases—makes a special plan of construction necessary.

"The addition of one hundred beds in the private hospital and sixty beds in the Bulfinch Building, which can be added when the Moseley Memorial Building is occupied, will make necessary an increase of about eighty-five nurses. A new home should be provided, perhaps upon the land owned by the hospital on North Grove Street. This home should be large enough to accommodate the immediate increase in the size of the school, and the increase which will be necessary if we are able in the future to build a hospital for people of moderate means and a children's hospital, so urgently required.

"Upon recommendation of the general executive committee, the trustees have authorized a

consultation clinic for people of moderate means. The cost of the necessary laboratory tests and consultations with recognized experts has become so great that people of small means cannot obtain them individually. The plan proposes that the family physician shall bring or send his patient by letter to this clinic in order that he may obtain a correct diagnosis by modern methods and an outline of treatment, if he desires it. The patients are to pay a fee of \$5 each.

"The School for Nurses at the General Hospital has had a successful year. We have been able to raise the standard of admission, so that our school is composed of a very high type of young women. The statistics of our graduates show that a very large proportion of them are filling executive and teaching positions in hospitals and that those in private nursing are in great demand.

"A nurses' home at McLean Hospital is badly needed. There is a considerable fund already established for this purpose, and it is hoped that benefactors of the hospital may add to this in the near future."

MEDICAL SERVICE IN A MUNICIPAL COURT.

At the request of the Boston city council, the municipal court of Boston has recently issued a report presenting a statistical survey and a discussion of its work for the past fifteen years. With special reference to the evolution of probationary treatment, the report describes the work of Dr. V. V. Anderson in the psychologic study of prisoners and delinquents.

It is, moreover, recognized that this work should extend beyond the limits of the probation system, and that it demands for its full development a degree of autonomy. Upon the recommendation of the municipal court, therefore, in 1915, legislative permission was given for the establishment of a department of medical service. With regard to the work of this department, the report continues:

"Aside from the direct assistance which the court derives in a more intelligent disposition of its cases, it is to be hoped that the research data gathered in this field may aid in no small degree to point out ways in which society may relieve itself from the burden of crime. The work already done has served to accentuate the need of an institution to which the court may commit, for prolonged detention, persons not insane according to present legal standards, and therefore amenable to the criminal code, who by reason of feeble-mindedness cannot respond

to probationary treatment, and who need hospital treatment rather than penal discipline."

So much public interest has attached to this novel branch of court work that a special report about it, submitted by Dr. Anderson, is presented in Appendix C of the main report. In his conclusions from this survey, Dr. Anderson summarizes in part as follows:

"Within our criminal courts the problem of responsibility, the question of dealing justly and intelligently with offenders, has made it customary for judges occasionally to call in alienists to determine the mental condition of certain offenders.

"With the introduction of this medical and psychological work in the municipal court of Boston, daily, individuals are being sent in for examination in order to determine their responsibility or their need of medical attention.

"Of those whose mental condition was the problem, feeble-mindedness easily outranks all others as a cause; 37%+. Other pathological mental conditions are being met with, such as insanity and epilepsy. Of those whose physical condition is the problem we find serious impairment of nervous system from alcohol and drugs, tuberculosis, heart disease, venereal diseases.

"From the probation officers all types of problems are brought, whether it be examining for the presence of drugs in suspected cases that deny their use; or in studying the underlying causes within the individual probationers themselves for their misconduct; getting at their capabilities and adaptabilities, with a view to better understanding their makeup and their possibilities, to be used in so handling them on probation as to adapt each individual's supervision and treatment to his or her special needs.

"Through the psychology of human differences it is possible to bring to light special mental defects, peculiarities and experiences, both personal and social, that have all to do with the production of antisocial conduct. And here lies a most constructive side of this work, for in studying the underlying makeup of young delinquents and so fitting their treatment to meet their individual needs, the saving to society by averting criminal careers is immense."

The importance of such work in the study of the medical aspects of crime and misconduct is obvious to all, and the attention of laity and profession is called to this report, whose careful reading is of value, not only for information, but for establishment of opinion.

P. S. D. FUND.—The initial response from Boston to the appeal for the P. S. D. fund, published on the last page of this issue of the JOURNAL, amounted to \$1718.

MEDICAL NOTES.

NEW YORK DEATH RATE.—Figures compiled by Registrar Guilfof, of the New York Department of Health, showed that the death rate for the past week was a trifle higher than during the corresponding week of 1915. During the past week 1628 persons died in the City of New York, as compared with 1571 during the corresponding week last year, the respective rates being 15.20 and 15.03 per 1000 population. The difference of .17 in the rate is equivalent to an increase of 18 deaths, the remaining 39 deaths being accounted for by the increased population. In other words, had the rate for the week ending Feb. 20, 1915, prevailed during the past week, there would have been 1610 deaths, as compared with 1628, which actually occurred. The acute infectious diseases showed a slight increase, namely 7 more deaths than occurred during the corresponding week of 1915. On the other hand, there were 16 fewer deaths from acute respiratory diseases, but the deaths from influenza, heart disease and nephritis were more numerous during the past week than during the week ending Feb. 20, 1915. The death rate in the boroughs of Manhattan and Brooklyn was lower than during the corresponding week of 1915, while in the other boroughs it was higher. The death rate for the first eight weeks of 1916 is 16.14, as compared with 14.81 of the corresponding period of last year.

NEW YORK HEALTH DEPARTMENT TO CELEBRATE ITS SEMI-CENTENNIAL.—The New York Department of Health is planning to celebrate the semi-centennial of its establishment by a banquet at the Hotel Plaza on Thursday, March 9. As at present constituted, the Department dates from 1866, when the Metropolitan Board of Health was organized to supervise the health of the cities of New York, Brooklyn, the counties of Westchester, Queens and Richmond, and part of the present county of Nassau. At that time sanitary conditions in this city were a disgrace; the death rate was higher than in any other large city in the world, and was apparently increasing. During the fifty years of its existence the death rate has been reduced from 36 per 1000 to less than 14 per 1000. Among the speakers will be Mayor Mitchel, Mr. Henry Bruère, Surg. General Gorgas, State Health Commissioner Biggs, Prof. Wm. H. Welch, Dr. Peter Bryce representing the Dominion of Canada, and Dr. Stephen Smith. The last named was one of the original Board of Health in 1866, and is still active in public affairs, being a member of the State Board of Charities.

FREE MUNICIPAL CLINICS FOR SCHOOL CHILDREN.—The free municipal clinics for school children which have been operated in New York by the health department, aided by the Bureau of Welfare of School Children of the New York

Association for Improving the Condition of the Poor, are to be closed and the work turned over to public hospitals. As a summary of the three years' work of the clinics the following résumé is offered: cases registered, 18,764; operations performed, 9,770; treatments, 61,422.

UNIVERSITY OF BUFFALO ALUMNI CATALOG.—The Alumni Association of the University of Buffalo has published a catalog, which contains the names of all classes graduated from the Medical Department of the University of Buffalo from the year of its foundation, 1846, until the present time; also the names of graduates of the Medical Department of the Niagara University from its organization in 1886 to 1898 when it became amalgamated with the Medical Department of the University of Buffalo.

Since its foundation, the University graduated 2,737 physicians, while Niagara University graduated 137, making a total of 2,974 graduates, 847 of whom have died and 207 cannot be located, making a total of 1054 dead and unknown. The Association's active membership is 1,820. The geographical index shows the U. of B. medical graduates in all parts of this country, Canada and abroad. Of the 800 physicians in Buffalo nearly 600 are U. of B. men. In Rochester there are 115 Buffalo graduates. In Batavia, Lockport, Niagara Falls, Olean, Jamestown, —in fact, in western New York, the Buffalo graduates predominate. In New York City and vicinity there are upwards of 70 Buffalo graduates. Chicago has about 20, and Detroit about 10.

EUROPEAN WAR NOTES.

FOURTH HARVARD SURGICAL UNIT.—On Sunday, March 5, the fourth Harvard surgical unit sailed from New York City aboard the *California* to relieve members of the third unit who have been on service in France since November 1, 1915. The members of this fourth unit are Dr. William E. Faulkner, Dr. Benjamin P. Burpee, Dr. Thomas F. Capeles, Dr. Samuel R. Meaker and Dr. William R. Morrison.

WORK OF A BRITISH UNIT IN SERBIA.—In a recent issue of the *Lancet* was published the following account, by a member of the unit, of the work of a British hospital unit in Serbia last year. It is interesting in comparison with the now familiar experiences of the American unit in Serbia under command of Dr. Strong.

"The Royal Free Hospital Serbian unit, organized and led by Mr. James Berry, F.R.C.S., and Mrs. F. M. Dickinson Berry, M.D., B.S., left England in January, 1915, to found a surgical hospital of 100 beds in Serbia. The party arrived in Serbia just when the typhus epidemic was at its height. In Nish the death-rate among the war prisoners was 60 per cent. Uzmitze had

lost all her doctors save an Austrian captive, Valievo was in quarantine, and so, in spite of the fact that the unit was designed for surgery, the majority of the staff applied to be sent to some plague-stricken spot to help against the scourge which was raging amongst the population. But the Serbian Government, alarmed at the loss of life among the British units already stationed at Uskub and Kraguevatch, decreed that the work must remain surgical in character, and sent the mission, along with the British Red Cross unit, to Vrnjachka Banja, a small watering place almost free from typhus, some fifty miles northwest of Nish. Here a hydropathic hotel was commandeered, the large dining-room turned into a main ward, a douche bathroom, became the receiving room, a steam bath the operating theatre, a radiant light bathroom the sterilizing room, while the clerk's office had all the windows plastered up and became the sulphur room in which clothes were disinfected. Soon the operations enlarged and the village school was absorbed. While this was in progress, suddenly the Serbian medical authorities sent a batch of sixty patients, all of whom had already or soon developed typhus in a most virulent form. The position was quite changed. The Red Cross had taken over the local medical barracks, and though we wished to coöperate, the place was too small for both units, and it was decided to build. Owing to Mr. Berry's energy and enthusiasm, a long wooden building was run up in incredibly short time on the Serbian labor standard. In the meantime the typhus patients were nursed in the small bedrooms of the hospital, a difficult task, as they each required constant individual care and a measure of restraint in delirium. To guard against the risk of further infection, measures were arranged in common with the Red Cross unit. One of the hot sulphur springs of the town provided a central bath in which all new arrivals were washed, and head, pubic and axillary hair shaved, passing thence into a quarantine hospital under Mr. E. Ulysses Williams, hastily adapted from the 'State' café. Here the patients were kept for ten days until, all danger of developing typhus being over, they were distributed amongst the various hospitals of the town.

"The accumulating number of slightly septic cases with wounds which would not heal, and of crippled Austrian prisoners who could not be repatriated, necessitated further extension which was found in the 'Merkur,' a large villa in the park. The threat of a hostile advance in May and a great influx of wounded led to still further enlargement, and the 'Athene,' another big villa standing in the main street of the town, was got ready with the help of a band of Austrian prisoners. The number of beds was thus brought up from an initial estimate of 100 to a possible 450, in spite of the fact that some of the staff, their three months' contract over, had returned to England. The problems presented were mainly sanitary, for the Serbs' domestic habits

were uncleanly. Surgery was for the time relegated to the second place, and Mr. Berry became a sanitary engineer. With the assistance of Mr. Jan Gordon, engineer to the unit, the existing lavatories of the villas were cemented down, the overflowing cesspools thoroughly drained and then concreted over, and a dry-earth system instituted. The hardest task was to induce the patients to use the system in a clean and healthy manner. The yard of the 'State' café was a filthy swamp; drains were laid in this. With the help of an intelligent Austrian prisoner, destructors and boilers were built; the model was afterwards adopted by the Serbian sanitary authorities."

CHICAGO UNIT AT THE FRONT.—Report from London states that, on February 26, a unit of 33 American nurses from Chicago left for six months' service in field hospitals at the British front.

WAR RELIEF FUNDS.—On March 4 the totals of the principal New England relief funds for the European War reached the following amounts:—

Jewish Fund	\$888,132.74
Red Cross Fund	144,971.60
Belgian Fund	102,231.58
Serbian Fund	82,147.68
American Ambulance Fund ..	75,191.58
Allied Fund	66,388.80
French Wounded Fund ..	52,450.31
Armenian Fund	34,676.79
French Orphanage Fund ..	29,947.87
Polish Fund	21,991.47
Surgical Dressings Fund ..	19,888.55
Italian Fund	15,469.35
French Refugees' Fund ..	7,340.50

AMERICAN AMBULANCE HOSPITAL.—Efforts are being made to have individual beds at the hospital endowed. It is estimated that for about \$600 a bed can be supported for one year, the bed bearing a commemorative plate with the name of the donors, and it is planned to have nurses in charge of these beds communicate directly with the donors regarding the work that is being done. Contributions are coming in from Chicago, St. Louis, the South and the West. The American Ambulance Hospital depends entirely on America for its support.

BOSTON AND NEW ENGLAND.

MEDICAL SOCIAL SERVICE NURSES.—The demand for medical social service and for public health workers with social service experience has become so insistent that the Massachusetts General Hospital School for Nurses is arranging a number of lectures, with a certain amount of practical experience on the wards in social service, for all the pupils of the school. This is in

addition to the special course that is given to several student nurses every year in the social service department.

CHANGES IN DEATH RATES IN BOSTON.—The Boston Health Department issues in its Bulletin the following computation to show the varying rates in some of the leading causes of death from 1850 to 1915. Heart disease in the year 1850 ranked as 3.80 as a cause of death and rose steadily until in 1915 it stands 21.50. Pneumonia has varied but little. Cancer with a per cent. of 2.12 in 1850, has become 11.40 in 1915, and kidney disease from .44 has become 10.93. Pulmonary tuberculosis, on the contrary, had a rate of 42.82 in 1850 and has fallen to 13.78 in 1915. The total number of deaths reported from cancer in 1915 was 855, classified as follows:—

Cancer of stomach and liver	257
Cancer of peritoneum, intestines and rectum	149
Cancer of female genital organs ..	124
Cancer of breast	93
Cancer of buccal cavity	38
Cancer of the skin	14
Cancer of other organs, or not specified	180

There were four deaths reported under five years of age. The range of ages was from under two years to ninety-five years.

FREE WASSERMANN TESTS.—The Bacteriological Laboratory of the Boston Health Department is prepared to examine blood specimens by the Wassermann test for syphilis. Tests are made each Tuesday, Wednesday, Thursday and Friday. Patients for whom the test is requested should be sent to the laboratory, Room 1101, City Hall Annex, where the blood specimens will be taken. History blanks will be mailed to any Boston physician on request, and each patient appearing at the laboratory must present one of these, carefully filled out and signed by his attending physician. The laboratory will be prepared to receive these patients and to collect the blood specimens on Mondays, Tuesdays, Wednesdays and Thursdays, from 2 to 4 p.m., only. Specimens will not be collected at any other time, nor will they be collected from patients coming without a carefully prepared history card. Owing to the large number of requests, outfits for collecting blood specimens will now be furnished to physicians who call or send to the laboratory for them. The specimens must be returned to the laboratory by messenger. Culture stations are forbidden to receive them. Physicians who desire instruction in taking these specimens may bring their patients to the laboratory at the regular hours for this work and the method will be demonstrated. This test, like all laboratory tests furnished by the department, is without cost to physician or patient.

EXAMINATION OF PRISONERS.—On July 8, 1915, the State Board of Insanity of Massachusetts voted to delegate Dr. Charles B. Sullivan, examiner of insane prisoners for the Board, to examine a group of selected patients at the Bridgewater State Hospital and a group of prisoners at the Massachusetts State Prison, to determine whether they were sane or insane malingersers.

On August 12, 1915, it was also voted that Dr. Ernest B. Emerson be added to the examiners of prisoners at the State Prison and of patients at the Bridgewater State Hospital who have been transferred from one institution to the other more than once, and all persons who have ever been returned to the Bridgewater State Hospital from the State Prison who are now confined in either institution.

Reports have been received from Drs. Sullivan and Emerson on their examination of 17 prisoners, a copy of which was furnished the Prison Commission. Dr. Sullivan reports that out of this number he believes six to have been insane and recovered; 5 to have been insane in part, with a question of malingering added thereto; 3 in whom there is a question of their being insane or malingersers; and 2 in whom there is a question of their being insane without any thought of malingery.

HARVARD VETERINARY ALUMNI ASSOCIATION.—The nineteenth annual meeting of the Harvard Veterinary Alumni Association was held in Boston on Feb. 23. Dr. Wm. A. Naylor of Boston discussed the effect of the advent of the automobile on the practice of veterinary surgeons during the past ten years. He commented on the establishment by wealthy citizens of institutions wherein sick and injured animals are treated and operated on for fees far lower than qualified and experienced veterinarians can accept. He said that while the automobile has increased the number of accidents to small animals, it also has tended to increase the price of horse flesh; and that owners of valuable stock are more willing to pay a reasonable fee for their treatment than in years past.

The following officers were elected for the ensuing year: President, Dr. John W. Robinson of Natick, Mass.; secretary-treasurer, Dr. James J. Mulvihill of Norwood, Mass.

RACES AT THE BOSTON DISPENSARY.—In her recently published report, the registrar of the Boston Dispensary states that among the 35,000 patients treated in that institution during the past year, there were represented 34 pure races and 29 types of mixed parentage. Only 25% of the total had both parents born in the United States; and 22% of the total were Hebrews.

HOSPITAL BEQUEST.—The will of the late Annie E. Symonds of Beverly, Mass., which was recently probated, contains a residuary bequest of about \$50,000 to the Beverly Hospital.

Obituary.

HENRY BAIRD FAVILL, M.D.

DR. HENRY BAIRD FAVILL, of Chicago, who died of pneumonia on February 20, at Springfield, Mass., was born at Madison, Wis., August 14, 1860. He was the son of Dr. John Favill, an old-time practitioner of that locality. He was a graduate of the University of Wisconsin and the Rush Medical College of Chicago, and received the honorary degree of LL.D. from the University of Wisconsin in 1913. He first practiced with his father at Madison and later went to Chicago, where for 22 years he had been one of the leading clinical authorities in the city. Dr. Favill had been president of a number of medical organizations in Chicago and chairman of the council of health and public sanitation of the American Medical Association. He was also active in civic and social life. He was interested in the revival of New England agriculture through his activity as a breeder of fine Holstein cattle. He had been president of the National Dairy Council and vice-president of the National Holstein-Friesian Association. He was an extremely proficient presiding officer, a rare quality in physicians.

Miscellany.

DR. STRONG ON THE PLAGUES OF MAN.

In a recent issue of the JOURNAL we noted briefly the first two of the series of lectures at the Lowell Institute by Dr. Richard P. Strong on "The Plagues of Man." In the third of these lectures, devoted to bubonic plague, Dr. Strong outlined the history of this important epidemic scourge which, during the past fifteen years has caused over eight million deaths in India alone. He then described its clinical phenomena and the modes of its transmission, referring particularly to its enzootic occurrence among ground squirrels in California and efforts which are being made for its eradication among them. He also discussed the methods adopted for the extermination of rats in various infected regions.

"Our method in Manila whenever any outbreak of the plague was reported, was to select a point in the city and then draw radiating lines from that point out toward the suburbs. Down these lines our rat catchers would work, and then fix the point farthest out on each of these lines where any infected rat had been found. Connecting lines drawn between these outside points would determine the area in which our rat-catching squads should concentrate their efforts. It is, of course, a mistake to begin catching rats at the center and work out, as that merely drives the rodents farther and farther out.

"When the infected area has been determined, the proper thing to do is to construct a galvanized iron fence around its boundaries. This fence must be sunk two and a half feet into the ground, and more than three feet high. The rats will not burrow, it has been found, more than two and a half feet deep nor jump over any obstruction more than three feet high.

"It is, of course, very important to protect shipping against the plague, for otherwise the disease might quickly be spread to all corners of the globe. In all dangerous ports, rat shields are now required to be attached to every hawser to prevent the entrance of rats aboard ship. It is further required that the ships themselves should be boomed away from the docks, so that the rodents cannot pass directly on board them. In many ports today the docks are being constructed so that they will be as nearly as possible rat-proof, being built on concrete foundations without any connecting beams along which rats might crawl."

The fourth lecture on the Black Death described Dr. Strong's campaign in China when the scourge broke out in that country in 1910. The pneumonic plague, known as the Black Death, which destroyed about one-fourth of the population of Europe, appeared in that continent in the year 1384, after devastating Asia and Africa. It moved into Europe from a focus in the Crimea and from a second focus by way of Austria. It swept all before it, demoralized the people, who forsook all other considerations and tried madly to save themselves.

"Such was the terrible plague which disappeared in epidemic form after the year 1384, not again breaking out until 1910 when it appeared in Manchuria and North China.

"No doubt exists concerning the source of the epidemic. The marmot in China, known as the ptarmigan, was epizootically afflicted with the disease, and the trapping of this animal, for the increasing trade in its fur, had lately become extended. The trappers closely crowded round the market centers of the north as winter came on, were living under conditions particularly favorable to the spread of an epidemic. When the disease did pass to man, 400 trappers in the town of Manchuria immediately succumbed. Two men from this city, traveling by railroad to Harbing, carried the plague to other regions, and it spread rapidly to all regions and south to Mukden. Great numbers of farm laborers, anxious to leave the north with the arrival of cold weather, were moving out of the infected district, and these 60,000 coolies carried the plague far and wide.

"In the infected region itself there were no suitable hospitals. At Mukden, for instance, an old temple was converted for use as a hospital. Long board platforms were set up in it in lieu of beds. The Chinese doctors stood outside of the windows and conversed with their patients at somewhat long range, often getting the pa-

tients to count their own pulse-beats while the doctors timed them. On account of the fear of the plague, the sick were given no medical care whatever, and the dead were removed and handled by long hooks in the way that stevedores handle cargo. Great cold prevailed, even chloroform sometimes froze as it was being administered. It may be said that the fear of the Chinese was justified because during the course of the epidemic twenty-three of the hospital staff developed the disease and died, and 127 of the attendants outside of the hospital died."

In his fifth lecture, on Asiatic cholera, Dr. Strong stated that the disease first appeared in the United States in 1832 and reappeared several times in the latter half of the nineteenth century.

"In the past twenty years in India alone, Asiatic cholera has killed more than seven million people. Its history before 1817 is more or less indefinite, although the disease certainly was not known in Europe or America prior to that year. In 1817 an epidemic of cholera in India spread into China and Japan, and became in effect a world-wide pandemic. A second outbreak was carried to Germany in 1831, and in 1833 ravaged Europe and the United States. The epidemic in America, first entering this country through New Orleans, produced valuable memoirs on the disease by James Jackson and Jacob Bigelow. The high quality of the work against the disease done by Dr. Bigelow, who was one of Technology's founders, is instanced by the fact that here in Boston, where his preventive work was done, the mortality was limited to one hundred cases, whereas in New York City it reached 3000 deaths.

"Repeatedly the plague entered America during the latter half of the nineteenth century, usually coming by way of the port of New Orleans. The last great epidemic broke out in 1900, and may be said to be still under way. It has never been known to any extent on the western coast of South America, but with the opening of the Panama Canal, and the establishment of more direct lines of commerce between India and Balboa, it will not be surprising if cholera appears on the western coast.

"The chief centre of cholera is the city of Benares in India, where the heat and great moisture favor the course of the disease. Here along the banks of the Ganges, the river in which millions of Hindus bathe themselves, wash their clothes and their elephants, find their drinking water and much religious consolation, cholera rages mightily. Thousands of India's Hindus, which constitute two-thirds of her population of 315,000,000 people also come to the city on pilgrimages and make haste to bathe in the Ganges and drink of its waters. Adding to the opportunities for infection, there are along the banks of the river many sacred wells, of which the waters are supposed to cure various diseases, but by which cholera and other infections are easily spread. The drainage of the

city largely passes into the Ganges, and many dead bodies are given burial in it in accordance with a religious practice.

"The Indian government has been very unsuccessful in coping with the disease and with the conditions that cause it. As a result epidemics of the plague continue, and the rest of the world suffers."

Regarding yellow fever, Dr. Strong stated that,

"In comparison with the other infectious diseases, however, yellow fever has a very limited geographical distribution. One of its worst important centres is the West Indies, whence it has repeatedly spread northward to the United States and Mexico, southward to Brazil, at times as far as Buenos Aires and Montevideo, west to Central America, and across the Isthmus of Panama to the Pacific coast, along which it has extended north to the Gulf of California and south to Peru, even to Chile. It occurs also epidemically on the west coast of Africa.

"The United States has suffered more from this disease than any other large country. Nearly every one of our great seaports has been invaded by yellow fever, and the losses from it have been enormous. Many of our interior towns along the water courses or railroads have also suffered severely. In the epidemic of 1878, over 13,000 people lost their lives in the Mississippi valley. According to the available records, over 100,000 deaths from yellow fever have occurred in this country since 1793.

"A great many attempts have been made to discover, isolate, and cultivate the germ or virus causing yellow fever. Various bacilli isolated from yellow fever cases, and believed to be the cause of the disease, have later been proved to be organisms of a different nature. Thus far the true organism of the disease has not been successfully cultivated.

"Reed and Carroll in their investigations showed that the filtered blood of yellow fever cases was infective and evidently contained the parasite of the disease. They also showed that after such blood had been passed through a porcelain filter it still remained infective. A French commission proved that the disease could be communicated by the inoculation of infected blood, filtered through the closest grained Pasteur Chamberland filter which is made. Therefore the organism of yellow fever is not visible even with the highest powers of the microscope. It must have a diameter of less than four-tenths of a micron, and hence it is evident that we shall not be able to see it, certainly not in the form in which it occurs in the blood, until we have magnifying lenses of greater power than the ones we possess at the present time."

Yet, inasmuch as the method of transmission of yellow fever is well known and the extermination of the disease-carrying mosquitoes possible, the eradication of this disease is prac-

ticable by concerted action of the nations involved.

In his last lecture Dr. Strong urged better preparation on the part of medical army officers to care for the health of large bodies of troops. The ravages of dysentery and typhus fever during the Civil and Spanish Wars should never be allowed to be repeated. Regarding the control of typhoid fever in the army, Dr. Strong stated as follows:

"There has been recently a great tendency to assume that now that we have anti-typhoid inoculation, this method alone will protect our inoculated troops from serious outbreaks of the disease. The low rate of typhoid in our armies during the past few years is not by any means due alone to anti-typhoid inoculation but also particularly to the other sanitary measures taken for the prevention of this disease. If we should attempt to rely upon protective inoculation alone, and place our troops in an infected community, we should find the fallacy of the idea that inoculation is absolutely protective.

"It is perhaps unnecessary to report the fact that in Mrs. Stovart's British field hospital in Serbia, during the past year, where all of her staff had been carefully inoculated against typhoid fever, 21 out of 42 of her staff, or 50%, contracted the disease, and 10% died of it. In the French army in northern France I found on my visits to the front in March that already about 100,000 cases had occurred among the troops. The public has obtained a false idea of absolute security in anti-typhoid inoculation, and many of our physicians are also imbued with the same erroneous idea."

CONTINUED INCREASE IN COST OF DRUGS.

FOLLOWING the slight temporary cessation of the rise in the cost of drugs at the beginning of the new year, a still more rapid rate of advance has set in during the past month. Report from New York on January 31, speaks of this advance in part as follows:

"The most conspicuous development has been the exorbitant inflation of values for all Far East drug products following advances in ocean freights to rates never heard of before. The use of the Cape of Good Hope route to and from the Far East by practically all British, Japanese, Scandinavian, French and American ships, instead of the usual Suez Canal route, has not only proved detrimental to Mediterranean ports, such as Marseilles, Genoa, Leghorn, Naples, etc., but has delayed goods in transit to the United States fully one month, and has, moreover, appreciated the spot value of Chinese, Japanese, Javanese, Indian, Ceylon and Straits Settlements products generally. All round advances have been named in freight rates, and

practically no more space for merchandise tonnage is obtainable from Colombo, Ceylon or Calcutta, India, until the middle of February. War risk and insurance rates have also jumped sharply and have added 5 to 10% on the original cost of the goods offered for import.

"Castor oil prices have risen from a basis of 15 to 27 cents per pound, and little, if any, is now obtainable at less than 30 cents per pound and upwards, owing to a dearth of castor seed and castor beans, which are obtained from India. None the less important have been the sharp advances in China products. Cablegrams from Hankow, China, state that the Chinese Government has requisitioned private junks, steamers, and other conveyances afloat along the Yangtze river which were used for carrying China wood oil from the upper part of the river to the Hankow markets. It is feared that shipments of the oil will thus be badly delayed. The market for Manchurian bean oil has also been thrown on end by the heavy purchases by the United Kingdom. Sales of close to 140,000 barrels for March-April shipments have been closed to the United Kingdom, and it is understood that British importers have paid one-half cent per pound higher than New York importers have been willing to pay. Recent imports into the United States include more than 96,000 packages and an additional 180,000 packages are now en route.

"Recent advices received from Amsterdam, Holland, tell of an advance of more than 50% in prices of pharmaceutical cinchona bark, where 1919 packages, or 121,398 kilos, were offered at auction on Jan. 20 last.

"Predictions of a further advance of 25 cents per ounce in quotations for quinine sulphate are being made by the interests in closest touch with the situation, the new schedule being warranted by the heavy appreciation in value of the crude material. Italy and France are inquiring for the drug in this market from time to time, and the shortage keeps prices in outside hands strong at \$1.05 and \$1.15 an ounce.

"Nux vomica, of which the active principle is strychnine, is another Indian product which has greatly appreciated in value here within the past few days. The schedule of prices as now quoted by the manufacturers, is 80 cents for the sulphate powdered and crystals in bulk, and 83 and 86 cents for the alkaloid powdered and crystals, in bulk. Makers are not, however, entering contracts at these figures, but are only soliciting the preference of orders for prompt deliveries.

"Sandalwood oil has advanced to a cost of \$7.00 per pound."

The Boston Association of Retail Druggists has recently issued a statement showing the percentage increase in cost of certain drugs during the past 20 months. Some of the most notable of these are as follows: Acetphenitidin, 1600%, antipyrine, 2000%; atropine, 1900%; benzoic acid,

1000%; carbolic acid, 1200%; creosote, 1200%; quinine, 700%; lanoline, 700%; mercury, 800%; mustard, 900%; synthetic oil, 1200%; phenacetine, 2500%; phenolphthalein, 1300%; potassium permanganate, 800%; saccharin, 1000%; salicylic acid, 1000%; salol, 1000%; tartar salts, 1000%; sodium salicylate, 1000%; and thymol, 600%.

On the last page of this issue of the JOURNAL we publish a tabulated statement of the present cost of the common drugs whose prices have been affected by war conditions.

THE LEPER COLONY ON PENIKESSE ISLAND.

In the issue of the JOURNAL for January 27, we published a note referring to remarks made by Dr. R. P. Strong, in a lecture given at the Lowell Institute on conditions in the leper hospital at Penikese Island. His criticism of these conditions was in no sense aimed at the officials in charge of this institution, but was intended rather to rouse popular interest in making more adequate provision for the care of this important and increasing class of chronic patients. In the daily press there appeared on January 24 a letter from Mr. Robert W. Kelso, secretary of the Massachusetts State Board of Charity, in reply to Dr. Strong's statements; and in justice to all concerned, it seems only fair that this letter should be reproduced in part in the columns of the JOURNAL.

"The first case of leprosy coming to public attention in this state was isolated Dec. 11, 1882. Since that date twenty-nine cases diagnosed as leprosy have been apprehended, bringing the total of all lepers known to the authorities thus far in Massachusetts to thirty. Four of these were deported under immigration laws; two were discharged for treatment elsewhere; two escaped from the custody of local authorities and were not again apprehended; ten have died; and twelve are now in residence at Penikese Hospital. The total of those who have ever gone to Penikese is twenty-four. The largest number ever there at one time is sixteen.

"Penikese Hospital, aside from an administration building and appurtenances, consists of four cottages, each comfortably housing two patients, and a hospital building with quarters for ten patients, as at present arranged. Each cottage provides a living room, two bed rooms, a kitchen and bath. The hospital building provides ten private rooms, a general living room, a general dining-room and quarters for nurses and attendants.

"The twelve patients now in residence are attended by two physicians, one nurse (two until recently), and one orderly. They have six private baths for their use. They have all the

privileges consistent with the limitations of an island institution. Thus, each patient has his garden in summer, for flowers and vegetables. He is free to roam over the greater part of the island. He may row or fish from small boats about the shore. Each patient is given such books as he wishes to read. Parrots are kept as pets in the separate cottages. In the living room of the hospital building, the patients have a talking machine, an organ and a pool table. Some entertainment is provided each week, together with religious services. In general, it is a fair statement to say that every reasonable wish of the patient is fulfilled. The problem of making life exiles truly happy is hard at best; it becomes all the more difficult when it is remembered that these twelve patients represent eight different races and that many of them understand English imperfectly. Three of the twelve are Chinese, two are Hebrews born in Russia, two (colored) are natives of the Cape de Verde Islands, one Japanese, one Italian, one Greek, one Lett, and one American. But, in spite of the difficulties arising out of the solitude and the divers races, the patients at Penikese are cheerful and reasonably content.

"Fear of leprosy has caused the public to enforce this exile. The cost in money spent to maintain an isolation hospital at this remote place is excessive. Thus, for the past two years maintenance appropriation for Penikese has been \$28,000 per year. The totals spent thus far indicate a lively public conscience in the care of these unfortunates. State expenditures to the close of the last fiscal year (to say nothing of outlays by cities and towns) have totaled \$265,262.80. In this sum is all the purchase and construction cost of Penikese, a large part of which is in the nature of an overhead charge. But if liberal allowance be made on this account, there is still an exceedingly heavy outgo for the care and treatment of the few persons who have been thus far isolated because of this disease.

"It is true that the State Board of Charity has sought for several years a sufficient appropriation to permit the construction of better hospital and dispensary facilities, but present quarters are fairly good, and when we reflect that the people of Massachusetts must give kindly and intelligent care to 20,000 insane persons, and to 14,000 others in her charitable institutions, each group pressing for larger facilities and ever more specialized treatment, it should not be said of the public or of their intelligent law-makers that they are neglectful of their duty toward these twelve patients. The facts and figures used in this statement are on record in the files of the State Board of Charity."

As a matter of fact, the views of Dr. Strong and Mr. Kelso are not seriously at variance. Without criticism of anyone, the real point at issue, in which all would be agreed, is that adequate provision and care for the segregation of

lepers should be made, either by the national government or by the state within whose confines they reside.

Massachusetts has always been foremost in providing for the care of its lepers, but the cost of this provision is excessive in proportion to the number of patients cared for. The annual expense for the Massachusetts Leper Colony on Penikese Island is about \$28,000, and the state has expended a total of about \$265,000 on this institution since its establishment. The care of lepers throughout the United States could be undertaken more thoroughly, uniformly and economically by the federal government. There are at present about 2400 lepers in this country, and a bill is now pending before the federal congress for the establishment of a leprosarium for their care. On February 15 a hearing was held on this bill in Washington before the Senate Committee on Public Health and Quarantine. A number of dermatologic experts appeared before this hearing and testified in favor of the bill, among them being Dr. H. M. Parker from Massachusetts. As a matter of fact, the ultimate decision on this question should settle permanently the point at issue with reference to the Penikese Island Colony.

Correspondence.

A PROTEST ON MEDICAL LEGISLATION.

NANTUCKET, MASS., Feb. 25, 1916.

Mr. Editor: On February 24th inst. a hearing was held before a legislative health committee, on a bill, to allow registration to "herb doctors." One "doctor" in particular came in for prominent mention. There was no opposition to the bill from the medical profession.

It is high time the medical profession, in this state, began to learn the lessons of preparedness in order that we may protect the tenets of our profession from the onslaughts of those who are attempting to tear down the structure which it has taken centuries and many lives to mould. There should be committees appointed to meet these exigencies. Many times bills come before our legislative bodies of which the profession as a whole are totally ignorant. There ought to be some means of placing the profession on a "fighting basis" that they might be prepared. The enemies of the profession are always ready to enter a breach in our lines, it is up to the profession to meet these attacks. Registration for the "herb doctor" would open a fertile field for the charlatan.

The testimonials at the hearing, as reported in the newspapers, savored very much of the "Patent Medicine" variety, strongly tinged with oriental mysticism. Although the bill would only allow the "herb doctor" to prescribe and administer herbs, it would have the dangerous aspect of giving more power to those that are unqualified, in the treatment and care of the sick.

Respectfully yours,

FRANK E. LEWIS, M.D.

PRESENT COST OF COMMON DRUGS.

Aspirin	Per oz.	\$ 1.00
Atropine	Per gr.	.20
Bromide sodium	Per lb.	5.00
Bromide potassium	Per lb.	6.00
Cocaine	Per oz.	5.00
Chloral	Per lb.	2.00
Eserine	No advance in price	
Digitalis	No advance in price	
Hyosine	Per gr.	\$.40
Scopolamine	Per gr.	.40
Iodine:		
Potassium iodide	Per lb.	5.00
Mercury:		
Ointment	Per lb.	2.75
Bichloride	Per lb.	4.00
Calomel	Per lb.	4.00
Opium:		
Morphine.....	No advance in price	
Codeia	Per oz.	\$ 9.00
Heroin	Per oz.	11.00
Salicylate sodium	Per lb.	6.00
Sulphonal	Per oz.	1.25
Trional	Per oz.	1.75
Veronal	Per oz.	1.50
Iron preparations.....	No advance in price	

NOTICE.

PHYSICIANS', SURGEONS' AND DENTISTS' FUND.

February 25, 1916.

To the Physicians, Surgeons and Dentists of the United States:

Gentlemen:

We, the *Undersigned*, having devoted our energies for various lengths of time in helping our colleagues, the surgeons, physicians and dentists of France;

Realizing, that they are working under terrific stress and strain, under improvised conditions and often with an insufficiency of instruments and material, as attested by the enclosed bulletin of the War Relief Clearing House:

And feeling, that many of our colleagues here would gladly contribute a sum of money monthly for the purchase of instruments and materials here or abroad as wisdom and need indicate:

Propose, that such a brotherly manifestation of solicitude be made, and we call upon our professional brethren throughout this land in sympathy with the cause of Liberty and Justice, so dear to these two Democracies, to pledge themselves to contribute to this fund \$2.00 per month for the year 1916, from January 1st, to be paid monthly or in block. This sum to be placed at the disposition of the American Relief Clearing House in Paris, the official bureau of all American Charities, and in constant touch with all necessities over there. These sums to be expended in such a way as they may see fit, advised by a representative of the French Academy of Medicine, and a representative of the Minister of War, in order that the wisest possible use may be made of the funds thus furnished.

Further, we solicit donations of instruments in first-rate condition, and hospital equipment of all kinds; bearing in mind that in the present crisis everything is needed.

May we even ask our colleagues to economize in all wisdom, and not to waste in this land of plenty, but to contribute to the cause that which is saved. Also, that they may endeavor to interest their various clients to aid us in our work.

We pledge ourselves to our utmost to see that every contribution arrives where there is need for it and feel that this friendly gesture of one country to another through our professional channel, will be received with a gratitude most touching and bear fruit in the relations between our two countries in the future.

What the architects, artists and sculptors of our country have done for their confrères, who are in the ranks across the ocean, we may well do also.

(Signed) GEO. E. BREWER, M.D.
G. W. CBLE, M.D.
HARVEY CUSHING, M.D.
JOSEPH FLINT, M.D.
WALTON MARTIN, M.D.
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All moneys subscribed go to the fund without deduction for administration expenses.

Checks should be made payable to J. P. Morgan & Company, for the P. S. D. Fund, and addressed to P. S. D. Fund, 16 East 47th Street, New York City.

All contributions in material should be sent prepaid to P. S. D. Fund, War Relief Clearing House, 133 Charlton Street, New York City.

SOCIETY NOTICES.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY.—The next meeting of the New England Ophthalmological Society will be held at the Massachusetts Charitable Eye and Ear Infirmary, 233 Charles Street, Boston, on Tuesday, March 14, 1916, at eight o'clock.

PROGRAM.

Hospital cases.

Papers:

Continuation of Symposium on Refraction. Discussion to be opened by Dr. Greenwood.

Members are earnestly requested to be prepared to take part in the discussion and thus aid in making the meeting interesting and profitable.

It is suggested that members bring notes on any cases which may have been particularly interesting or difficult.

W. HOLBROOK LOWELL, M.D., *Secretary*

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the hospital on Tuesday evening, March 14th, at 8.15 o'clock.

PROGRAM.

1. Exhibition of cases.
2. "Studies in Experimental Pneumonia." Dr. L. H. Newburgh, Dr. J. H. Means, and Professor W. T. Porter.

3. "Studies of the Renal and Coronary Circulations." Dr. A. A. Ghoreyeb.

Medical students and physicians are cordially invited. Telephone, Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the hospital.

The Boston Medical and Surgical Journal

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Original Articles.

AN ANALYSIS OF FOURTEEN CASES OF DIABETES MELLITUS UNSUCCESSFULLY TREATED BY FASTING.

BY ELLIOTT P. JOSLIN, M.D., BOSTON,

WITH

F. GORHAM BRIGHAM, M.D., BOSTON,

AND

ALBERT A. HORNER, M.D., BOSTON,

[From the Department of Medicine of the Harvard Medical School, Boston.]

THE writers thoroughly believe in the fasting treatment of diabetes, as outlined by Dr. Frederick M. Allen of the Hospital of the Rockefeller Institute for Medical Research.* Under this treatment our diabetic patients do far better than ever before. It is rare that untoward symptoms develop if the directions originally laid down by Allen are followed exactly. Our only object in publishing this paper is to show why some of the patients so treated have died and to point out the apparent failure. During this period we have employed alkalis in the treatment of acid intoxication less and less, endeavoring to avoid the necessity for the use of alkalis by the prevention of acidosis. Fasting accomplishes this object in a large majority of the cases, but we have found it advantageous, in very severe, long standing and complicated

* Treatment of Diabetes, BOSTON MEDICAL AND SURGICAL JOURNAL, 1915, Vol. 172, p. 241.

Prolonged Fasting in Diabetes, American Journal of the Medical Sciences, 1915, Vol. 150, No. 480.

cases, without otherwise changing habits or diet, to begin treatment by omitting the fat in order to decrease the source of the acid bodies, after two days to omit protein, and simultaneously to halve the carbohydrate daily to 10 grams, and then if sugar has not disappeared from the urine, to fast. So far this plan has proved satisfactory. In fact, since September 22, 1915, no alkali whatsoever has been employed in the treatment of fifty-four successive cases of diabetes at the New England Deaconess Hospital, although acidosis has at one time or another been present in 37. Of this number only four cases showed acidosis on leaving the hospital, as determined by the ferric chloride reaction for diacetic acid. However, we fully realize that this method is not a decisive test for acidosis. During this period no case has died except Case No. 740, who, while conscious, died suddenly five hours after entrance. Yet we stand ready to use alkalis if the methods above described fail to prove efficacious.

The number of cases of diabetes mellitus fasted from May, 1914, to Dec. 1, 1915, has been 125; of these, 14 patients are dead. A considerably larger number of other cases of diabetes has been treated during this interval, and although fasting has not been practised, the principle of the restricted diet has been observed. In fact, it is almost impossible now to see a case of diabetes which has not been influenced by the principle of fasting which Naunyn recognized and used, Guelpa empirically employed, and Allen put upon a scientific basis by animal experimentation, and then tried successfully with patients.

A study of the fourteen fatal cases shows plainly, in the light of later experience, that at least 8 of these deaths might have been avoided or deferred, and no treatment could have saved the patient with cancer. Seven of these cases died because the fasting treatment was not completely carried out. Of the remaining seven cases, death in two was associated with an accompanying infection; one case represented extremely severe diabetes of long duration; in another cardio-renal complications and goitre were present; in a fifth cancer of the bladder; and in the sixth syphilis. The cause of death of the remaining patient probably had nothing whatever to do with diabetes. A summary of the causes is given in the following table:

Group.	Case Nos.	Causes of Death.	Number of Cases.
I. A....	648, 707, 430		
B....	764		
C....	740	Incomplete treatment	7
D....	868		
E....	865		
II.	855	Intercurrent infections	2
.....	513		
III.	887	Diabetes of long duration	1
IV.	576		
.....	869	Independent complications	4
.....	806		
.....	848		

GROUP I. INCOMPLETE TREATMENT.

A. The treatment in Cases Nos. 648, 707 and 430 was incomplete at the start because they were not fasted sufficiently to cause the persistent absence of glycosuria. Consequently, being sugar-free for only one or two days, the course of the disease was not markedly influenced.

B. The sudden abandonment of treatment shortly after the expiration of fasting, which was contrary to the advice of the physician in attendance, was responsible for the death of Case 764.

C. Complete lack of supervision after leaving the hospital was responsible for the death of Case 740.

D. The treatment was discontinued by the physician of Case 868, and six weeks later the patient died.

E. The danger of a sudden change to a protein-fat diet in diabetes of short duration was illustrated by a child, Case 865, two years and two months old. He developed signs of coma within twelve hours after his last meal, which was taken four hours before entering the hospital, where he was seen for the first time.

These are the cases in which it appears to us death might have been deferred. They are no reproach to the principles included in the fasting treatment. They correspond to tuberculous patients, who having undergone an open-air cure, with arrest of their disease, later return home to unhygienic surroundings. The death of such tuberculous patients is no stigma upon the open-air treatment.

These cases are reported more in detail in the fine print which follows:

A. Incomplete Treatment at the Beginning.

CASE 648 was the first case to be fasted. The diabetes was of a severe type, showing a minus carbohydrate balance of 25 grams the day after her entrance to the hospital on March 11, 1914. Upon a restricted diet the nitrogen was 6.1 grams, and the ammonia was 4.45 grams (ammonia-nitrogen: nitrogen = 60%). She remained sugar-free during a portion of one day only in May, 1914, was allowed gradually to return to her former diet, and died in coma on June 16, 1914.

CASE 707. Male, born May, 1897. Onset and diagnosis of diabetes in February, 1913. Came under observation March 7, 1914. During a stay of 3 weeks in the hospital, March 7 to 28, 1914, the patient did not become sugar-free, and the carbohydrate balance was minus throughout, except upon three oatmeal days. The ammonia varied between 2.2 grams and 5.4 grams. By special request, he consented to return to the hospital for a period of 6 days in May, 1914. During this time he was upon a low diet and actually fasted one day, but naturally failed to become sugar-free. Dietary restrictions were resented. His extraordinary appetite was disclosed by the 26.9 grams of urinary nitrogen.

Forty-six days after leaving the hospital the second time, during which period he entirely discarded dietary restrictions, he died in coma.

CASE 430. Male. Developed diabetes in June, 1908, at the age of 52 years, and came under observation in July, 1911. In September, 1914, he was placed upon a restricted diet and fasted, but only for one day. He returned to Canada, and died on March 12, 1915, of diabetic coma. The case is mentioned simply to include all cases in which fasting of any description was employed.

B. Abandonment of Treatment Immediately after the Fast.

CASE 764. Male, age 29. Onset at 26. First seen Sept. 9, 1914. Was fasted after leaving our supervision by another physician, who had had an opportunity to observe a few of our other cases which had undergone fasting. He reported that the patient did not follow the dietetic restrictions, exercised unusually soon after a seven days' fast, and died in coma Dec. 23, 1914, six days after the conclusion of the fast. The patient was treated in his own home, 7 miles from the physician, and was that physician's first fasting case. While at the hospital in July, 1914, the carbohydrate balance was minus 9 grams, and the ammonia did not go above 2.8 grams, but after a 7 days' fast at home the ammonia was 3.8 grams.

C. Lack of Medical Supervision after Leaving the Hospital.

CASE 740 was reported in detail in the *American Journal of the Medical Sciences* of October, 1915, Vol. 150, page 491. The young man developed diabetes at the age of 20 years and 10 months, in 1914. Nineteen days before entrance to the hospital, the urine showed 5.6 grams of ammonia-nitrogen in 24 hours, and 74 grams of sugar in the urine upon a supposedly low carbohydrate diet. The accompanying chart illustrates the course of the disease in the hospital. Chart, Table I.

TABLE 1.—CASE NO. 740, MALE. ONSET IN MAY, 1914, AT 20 YEARS AND 10 MONTHS.

Date 1915.	Body Weight.	Volume of Urine.	Reaction.	Total Nitrogen.	NH ₃ -N.	Acetone and Diacetic Acid.	Diacetic Acid. (Qual.)	Beta-oxylbutyric Acid.	Dextrose. (Grav.)	Carbohydrate.	Protein.	Fat.	Alcohol.	Calories.	Diet.	Blood Sugar.	Alveolar Air CO ₂ Tension.	CO ₂ per Kilo. per Min.	O ₂ per Kilo. per Min.	R. Q.	Calories per Kilo. per 24 Hrs.
March 27.....	54.0	3000	Acid	32.7	5.6	...	++	....	74	..	..	..	..	..	..	0.26	24.1	2.91	4.06	0.72	27.5
April 14-15.....	52.9	1430	"	12.44	2.64	3.11	+	19.99	40	..	..	..	0	..	..	0.43	29.5	3.02	4.15	0.73	28.2
(14 1/4 hrs.)																					
" 15-16.....	52.2	1540	SI. acid	16.48	3.16	3.70	+	18.33	39	13	50	70	0	882	0	0.26	24.1	2.91	4.06	0.72	27.5
" 16-17.....	51.7	1420	Acid	16.2	3.28	3.09	++	13.41	45	17	55	75	0	963	0	0.43	29.5	3.02	4.15	0.73	28.2
" 17-18.....	52.1	900	"	9.63	2.44	2.00	++	8.23	16	0	7	0	24	196	0	0.26	31.4	2.93	4.08	0.72	27.6
" 18-19.....	51.7	680	"	8.1	2.15	1.79	+++	7.85	8	0	0	0	0	24	0	0.33	31.0	2.84	3.87	0.73	26.3
" 19-20.....	50.6	580	SI. acid	6.72	1.73	1.29	+++	5.59	3	0	0	0	24	168	0	0.29	32.6	2.84	3.76	0.73	25.7
" 21-22.....	51.5	540	"	7.94	1.57	1.18	++	4.40	0	0	5	0	24	188	0	0.23	31.1	2.71	3.61	0.75	24.6
" 24-25.....	51.6	570	Acid	9.06	1.57	1.09	++	3.65	Trace	5	20	25	18	451	0	0.31	30.8	2.61	3.54	0.74	24.1
" 27-28.....	50.9	640	SI. acid	7.36	1.02	0.91	++	3.10	"	0	2	0	15	113	0	0.31	30.6	2.73	3.67	0.75	25.0
May 1.....	50.4	945	"	7.56	0.74	0.83	0	2.64	"	0	2	0	15	113	0	0.28	32.9	2.61	3.44	0.76	23.5

Following discharge in June, he resumed work, but gradually lost strength, gave up work, and despite repeated letters, refused to come under observation until October, 1915.

During this period the diet was followed with considerable care, but the patient was probably seldom sugar-free. The weight fell 13 pounds. He finally came to the office in a deplorable condition in October. Unfortunately, entrance to the hospital was delayed for five days, during which time we did not see him, until Oct. 13, when he entered at noon and died five hours later, with most of the symptoms of diabetic coma, though conscious up to 15 minutes before death. The examination of the specimen of urine secured during these few hours showed 200 c.c., specific gravity 1018, albumen trace, diacetic acid+++, nitrogen 0.96 g., ammonia 0.11 g., sugar 2.1%, no pus or blood, numerous large finely to coarsely granular casts. The alveolar air showed a carbon dioxide tension of 14.5 mm. mercury.

D. Abandonment of Treatment upon Advice of Physician.

CASE 868. Male, born September, 1900. Onset of diabetes in April, 1915. Glycosuria discovered May 17, 1915; came under observation May 25, 1915, and was fasted the following two days. At the end of this time the 24^{hr} amount of urine showed neither sugar nor diacetic acid. During the subsequent 17 days of his stay in the hospital, the diet was gradually raised to carbohydrate 39 g., protein 69 g., fat 145 g., calories 1742, or 46 calories per kilogram body weight, without the appearance of either sugar or diacetic acid in his urine. On August 9, 1915, he weighed 15 pounds more than upon discharge from hospital, and his urine contained 0.6% sugar. This disappeared in three days upon institution of a diet with same values as upon discharge from hospital. He was advised to adhere more strictly to the prescribed diet and on each Monday to halve it. September 29, 1915, his physician wrote:

"He continued on his diet through the summer, watching the sugar constantly and regulating diet accordingly. As time went on it became more and more difficult to keep the sugar down. In the early part of September there was quite a bit of sugar, even on a diet of 5% carbohydrate (two drops of urine would produce reaction in Haines' solution). One day of fasting 10 days ago failed to remove sugar, and I saw him the next day and he was very weak, had abdominal pains and pulse was 110. I advised adding one slice of bread and one small baked potato daily and 5 and 10% carbohydrates only. Since then he has felt much better—pulse better, some constipation, but no abdominal pain. He feels much stronger but does not go to school. Tip of nose is a little red. The urine is now 1037, diacetic acid present and 4 1/4% sugar by fermentation test. Passes about 3 quarts in 24 hours.

"His parents asked me to write you. I feel that he is steadily growing worse and should like your advice as to what course to pursue. Probably you will be more hopeful than I, but I cannot feel but that he would go down more rapidly on a more limited diet than he has at present."

The patient died 3 weeks later of diabetic coma. The duration of the diabetes in this patient was 6 months. Ten cases of diabetes have come under our supervision with onset at the age of 15. Of these cases 6 are dead. The average duration of the fatal cases was 1 year 10 months, and the average

duration of the living cases is, up to Dec. 1, 1915, 4 years and 3 months.

E. Danger of Sudden Change to Protein-Fat Diet.

CASE 865. Age, 2 years and 2 months. Developed diabetes 3 weeks before coming under observation, May 24, 1915. A grandmother has diabetes. The patient was said to have had 6.5% of sugar in early May, and was reported to have 1.2% of sugar on May 23, but the urine voided on the evening of May 24 showed 4.4% of sugar, with a marked reaction for diacetic acid, a slight trace of albumen, and an abundance of granular casts. Prior to admission to the hospital, the patient had been put upon a nearly protein-fat diet, and although his condition appeared fairly satisfactory when first seen at 10 o'clock at night, on May 24, he had clear signs of diabetic coma the following morning. Despite fasting, which began upon entrance, salt solution by rectum and alkalis by mouth, he steadily failed, although on the following day the respiration was not as typical of coma as before. Later complete coma ensued, and death in the evening of May 26. The last specimen of urine examined on May 26 showed no sugar and no diacetic acid.

GROUP II. INTERCURRENT INFECTIONS.

Intercurrent infections played an important rôle in the death of two cases. In Case 855 a gangrenous appendix in an elderly fat man was the primary cause, though the ether anesthesia, which was the secondary cause, was of equal significance. The therapeutic lessons to be learned, however, were that morphine should not precede anesthesia in a diabetic of this type, and that little or no ether should be employed. Whether this change would have enabled the patient to recover is problematical. At any rate, the carbohydrate tolerance would have been lowered less, and fasting treatment following the operation might have been successful.

A severe carbuncle of eleven days' duration was the source of infection in Case 513, and he finally died of multiple abscesses and septicemia. The lessons to be learned from the second case of this group are not so simple. We are content to report the facts here. We realize no dietetic treatment could have availed against the septicemia. Suffice it to say, however, that, except in one instance, no alkali has been employed by us since this patient's death. We were led to this step partly because of the great variations which it causes in the water balance of the body, by the serious effect large doses have upon the stomach, and by the hope that with a more rational preventive treatment of acid intoxication, its use may be rendered unnecessary. Yet our experience without using it, covers as yet only thirty-seven cases with acidosis. Instead, we have depended upon fasting and the feeding of small quantities of carbohydrate to prevent the appearance of acidosis, or to remove it if it occurred. The detailed records of the two cases follow.

CASE 855. Acute gangrenous appendicitis. An elderly gentleman of 70 years, weighing 220 pounds, was first seen 4 days after an operation for appendicitis, during which, to the great regret of the surgeon and physician in attendance it was necessary to use a large quantity of ether. This was in part due to 1-4 grain of morphine given subcutaneously preliminary to operation, which so reduced the respiratory excursion that nitrous oxide was a failure, and even a large quantity of ether required. The patient had developed an acute appendix while returning from the South April 9. On April 11 the white count was 17,000 and the temperature 100°. On April 12 the sugar in the urine was 11 grams, and that in the diet 18 grams. On April 13, the date of operation, the patient took 14 grams of carbohydrate in the diet, and voided 24 grams of sugar in the urine and 0.7 grams ammonia. He underwent almost complete fasting for the 4 days subsequent to the operation, yet failed to become sugar-free, and general circulatory weakness increased. The wound progressed satisfactorily. Subsequently, he was given whites of eggs and vegetable broths, with the result that the sugar in the urine rose. Later further additions to the diet were made, with the same result, and he finally died, 8 days after the operation, being conscious up to the last minute.

CASE 513. Multiple carbuncles and septicemia. Developed diabetes in October, 1911, at the age of 33, and first came under observation in July, 1912. At that time he became free from acidosis, but not from sugar, while at the hospital. During the next three years he worked hard in a market, living upon a partly restricted diet. He was not seen except during August, 1912, and July, 1913. Upon July 29, 1915, he tottered into the office, with a carbuncle on the neck of 11 days' duration.

During the first two weeks (July 29-August 12) in the hospital, the change in the condition of the patient was favorable, and the surgeon said the carbuncle did as well as with a non-diabetic patient. Deep-seated abscesses then began to appear in various parts of the body, and the patient began to lose weight, and in the last ten days before his death rapidly failed. His condition was most pitiable, complicated as it was with the pains of multiple carbuncles, extreme weakness and septicemia.

Acidosis steadily increased and he finally died, undoubtedly with acid-poisoning, but not in coma, on September 2, 1915. A blood culture made immediately after death showed a pure growth of staphylococcus aureus.

The dietary record of the case is shown first in summary and then in detail.

July 29 to Aug. 5.	Fasting, alcohol 32-48 gms. daily.
Aug. 5 to 9.	Protein 18-50 gms., fat 15-27 gms., alcohol 44-0 gms. daily.
Aug. 9 to 11.	Carbohydrate 1 gm., protein 58-66 gms., fat 42-58 gms., alcohol 0 gm. daily.
Aug. 11 to 12.	Fasting.

Aug. 12 to 13.	Carbohydrate 1 gm., protein 66 gms. fat 58 gms. daily.
Aug. 13 to 15.	Fasting.
Aug. 15 to 19.	Carbohydrate 1 gm., protein 73 gms., fat 75-89 gms. daily.
Aug. 19 to 23.	Fasting.
Aug. 23 to 28.	Protein 37-44 gms., fat 49-18 gms., alcohol 230 gms. daily.
Aug. 28 to 29.	Fasting.
Aug. 29 to 30.	Protein 12 gms., fat 10 gms.
Aug. 30 to Sept. 2.	Fasting, because he could not retain food.

It will be seen that he was fasted for 6 days, save for 48 grams of alcohol daily, and on the following 4 days took 18 to 50 grams protein and from 15 to 27 grams fat each 24 hours. He was then allowed a slightly greater quantity of protein and fat for 2 days, then again fasted for 2 days, when the urine became free from both sugar and diacetic acid. Following this period, he was fed one day, and then again fasted for two days, when the urine became free from sugar and the acidosis disappeared. Following this period the diet was again increased, but sugar returned, even amounting to 40 grams in 24 hours, although the carbohydrate in the diet was 1 gram, the protein 73 grams, and the fat 98 grams. After 4 days of fasting, the quantity of sugar in the urine fell to 46 grams only. From this time on he was given no carbohydrate and from 37 to 12 grams of protein and 46 grams of fat on 4 successive days; then several more fasting days were employed, yet at no time did he become sugar-free.

Carbon Dioxide. The carbon dioxide tension of the alveolar air was 30 mm. in the morning and 25 mm. during the afternoon of the day of admission, July 29, and gradually rose after the daily administration of 32 to 48 grams sodium bicarbonate in 7 days to 54 mm., and it will be seen that this persisted, even when smaller doses of alkali were given. On August 11 the carbon dioxide tension amounted to 55 mm. mercury, although no sodium bicarbonate was given that day. Later it decreased, coincidentally with the development of metastatic abscesses, and despite 80 grams more of sodium bicarbonate, it kept in the neighborhood of 22 mm. mercury.

Diacetic Acid. Diacetic acid was present throughout, except for two days.

Ammonia. The ammonia was 3.7 grams during the first days at the hospital; later decreased to the neighborhood of 1 gram, but during the last few days of life rose, reaching 5 grams in 24 hours, 4 days before death, although 96 grams of sodium bicarbonate were taken during this period.

Nitrogen. The nitrogen remained practically constant, between 9.3 grams and 12.9 grams, during the first 10 days of fasting and a low diet. In the following feeding period, two observations showed that it rose slightly, but the striking feature of the nitrogen excretion was the marked elimination during the last 6 days

of life, when it varied between 31.6 grams and 37.8 grams, although the patient took almost no food. How long the nitrogen had been high, we regret it is impossible to say, but the marked increase in nitrogenous excretion can hardly be explained by the washing out of retained protein, for at this period, although there were no carbohydrates in the diet, the amount of sugar in the urine was considerable, from 76 to 112 g. and it will be seen that the dextrose-nitrogen ratio at this time was approximately 3:1.

Sodium Chloride. During a portion of the period of observation the salt in the urine was determined quantitatively. It will be noted that this was very low,—4.7 grams to 3.3 grams 10 days after entrance to the hospital. During the latter portion of the starvation period, August 24-26, it was about normal,—8.7 grams to 12.3 grams,—but on the following days it rose with remarkable rapidity to 20, 35.8 and 35.6 grams. The striking increase in the excretion of salt came at a period in which the excretion of nitrogen was also great, and would lead one to conclude that the increased excretion of both salt and nitrogen were due to a washing out of the system of loosely stored nitrogen and salt, were it not for the fact that the sugar in the urine rose as well. One cannot logically attribute the increased excretion of sugar to a washing out of body sugar, because the per cent. of sugar in the blood throughout this period remained practically constant, and the diet contained no carbohydrate. It is more logical to conclude that the sugar and nitrogen stand in relation and that the sugar in the urine really comes from body protein, but before accepting this conclusion the remarkable changes in body weight must be considered.

Body Weight. The weight of the patient July 30 was 62.7 kilograms (138 pounds), and on Aug. 9, 65 kilograms (145 pounds), although the total calories ingested by the patient during these 7 days amounted to 2016, or 336 per day. Therefore this gain in weight must have been due to a retention of water. Explanation of this is afforded by the 264 grams of sodium bicarbonate given during these 7 days. Further evidence that sodium bicarbonate was retained in the body is furnished by the coincident gain in the CO_2 tension of the alveolar air. On August 5 the quantity of sodium bicarbonate had been reduced to 24 grams, and during the following 5 days was reduced still more, until on August 10 it was entirely omitted. Yet during this period the weight continued to rise 0.8 kilograms ($1\frac{3}{4}$ pounds). Edema was manifest, but not very marked, even when the weight was greatest. During the following 9 days, Aug. 11-19, no sodium bicarbonate was given, and the weight rose 0.3 kilogram ($\frac{3}{4}$ of a pound) more, but from this period on it steadily fell, and in 11 days, Aug. 19-30, dropped from 67.8 kilograms (149 $\frac{1}{4}$ pounds) to 51.8 kilograms (113 $\frac{3}{8}$ pounds), a

No. 513.

TABLE 2.

Date.	Vol. c.c.	Diacetic Acid.	NaCl.	Nitrogen G.	Ammonia.	D: N Ratio.	SUGAR IN URINE.				DIET IN GRAMS.				Carbohydrate.	Balance G.	NaHCO ₃ G.	Naked Weight of Patient.	Temperature.	Pulse.	Respiration.	Blood Sugar.	Percent.	Alveolar Air.	CO ₂ Ten- sion in m.m.	Hg.
							Reduction.	Rotation.	Total G.	Carbo- hydrate.	Protein.	Fat.	Alcohol.	Calories.												
1912																										
July 14-15	2010	++++			1.7		2.3	3.2	64	120						56	12	150			104					
18-19	2310	+						2.2	53	135						82	37	160								
19-20	4080	0						2.4	98	185						37	37	160								
27-28	1800	0						2.0	36									153								
1914																										
July 24	2500	SL. +						3.0	75																	
1915																										
July 29	—	++++		4.4	1.4																	0.37				
29-30	1900	++++		9.4	3.0	2.55:1		1.8	34	Fasting save			32	224	138		32	138	98.4	88	17					
30-31	3100	++++						1.0	31				48	336	138	31	48	138	94	82	17					
31-1	2400	++++		3.7				0.6	14				48	336	137	14	48	137	97.8	72	17					
Aug. 1-2	2200	++++		3.7				0.4	9				48	336	138	9	48	138	99.4	68	14					
2-3	2200	++++		3.2				0.6	13				48	336	140	13	48	140	94	83	17		0.24			
3-4	1600	++++		9.3		0.65:1		0.4	6				48	336	142	6	40	142	96.6	66	17		0.24			
4-5	1700	++		10.4	2.2	0.96:1		0.6	10				48	336	145	10	32	145	97	72	20					
5-6	1600	++		12.5	2.1	0.80:1		0.6	10		13	15	44	515	147	10	24	147	97.6	74	20		0.26			
6-7	1600	+		12.5	1.3	0.48:1		0.4	6		13	15	44	515	146	6	16	146	98.2	74	20		0.24			
7-8	1600	++		10.9	1.5	0.28:1		0.2	3		34	21	0	325	145	3	16	145	97.6	86	14					
8-9	1700	+		11.6	1.2	0.86:1		0.6	10		50	27	0	443	148	10	16	148	99	74	20		0.30			
9-10	2000	+		0.8				0.2	4	1	58	42	0	614	146	3	8	146	98.4	86	16		0.26			
10-11	1800	+	4.7	13.0	0.8	0.85:1		0.6	11	1	66	58	0	790	149	10	0	149	98.2	78	20					
11-12	2200			13.8						1	66	58	0	790	146		0	146	98.9	82	21		0.23			
12-13	2200		3.3	14.3		0.63:1		0.4	9	1	60	58	0	790	147	8	0	147	98.4	84	21					

Aug. 13-14	2400	0	0.0	0	Fasting	0	0	143	97.5	84	18	45
14-15	2000	0	0.0	0		0	0	146	96.2	100	20	
15-16	1200	+	0.4	5	1	73	75	0	971	99	90	
16-17	1400	+	0.6	8	1	73	75	0	971	98.6	96	
17-18	1400	++	1.4	19	1	73	98	0	1178	98.6	84	44
18-19	2000	+	2.0	40	1	73	98	0	1178	98.7	80	
19-20	2200	++	0.8	18	Fasting			0	149	98.4	84	
20-21	2200	+		22				0	145	98.4	80	
21-22	2000	+	1.05:1	26				0	143	98.6	100	
22-23	2500	+		22				0	143	98.4	94	
23-24	1900	+++	15.8	8.7	17.5	2.1	2.63:1	0	589	98.4	104	
24-25	2000	++++		13.9	27.0	2.9	3.07:1	0	998	98.2	98	
25-26	2800	++++		12.3	24.4	3.0	3.69:1	0	953	98.8	98	
26-27	4300	++++		12.0	32.7	4.2	3.07:1	0	615	99.4	98	
27-28	4000	++++		20.0	31.6	4.5	3.67:1	0	218	98.3	88	0.35
28-29	5600	++++		35.8	35.3	5.0	3.17:1	0	138	98.4	112	
29-30	6000	++++		35.6	36.9	4.8	3.39:1	0	12	98.9	94	
30-31	6000	++++		16.8	32.4	4.4	2.96:1	0	96	98.4	112	
31-1	6000	++++		9.6	37.8	4.8	1.90:1	0	72	97	126	
Sept. 1-2		++++		4.8	14.4	1.8	1.0	1.1	40	97	148	

NOTE.—Where there is a Benedict test, the calculations for total sugar in the urine were based on this test rather than the rotation test.

loss of 1.6 kilograms (3.5 pounds) per day. This rapid loss in weight was not detected in the first few days, because the patient was so feeble and in such pain from multiple carbuncles that it was difficult for him to be moved, but on August 30 this remarkable loss was proven. The actual loss may have been greater, for during this period 80, 96 and 96 grams sodium bicarbonate were administered on respective days, and before this alkali was given the weight may have been lower. As a matter of fact, it did rise during the following 48 hours to 52.4 kilograms ($115\frac{1}{4}$ pounds), when 144 grams sodium bicarbonate were taken. The weight of the body immediately after death dropped to 51.8 kilograms (114 pounds).

The striking loss of 1.6 kilograms (3.5 pounds) body weight daily for 11 days, and the coincident increase in sugar and nitrogen excreted, suggest very important changes taking place in the metabolism. They indicate the importance of maintaining reserve fluid in the body in a striking manner. So shrewd a therapist as Hodgson has recognized the advantage of having patients drink large quantities of mildly alkaline water. The therapeutic benefit which his clinical sense showed him to result from this procedure reveals striking confirmation in these figures. Furthermore, they suggest the importance of studying the weight of severe diabetic patients, preceding, during and after coma. We recall no figures which show so rapid a loss of weight in a diabetic patient.

These remarkable changes in weight suggest several lines for investigation: 1. Does the mere retention of fluid in the body lead to the retention of carbohydrate? 2. Does the retention of fluid in the body lead to a better utilization of carbohydrate? 3. Is the reverse of these two propositions true? 4. Might it not be possible by a series of experiments designed to increase the content of water in the body to throw light upon the capacity of the body to store carbohydrate? 5. May not rapid changes in the weight of severe diabetic patients be an early guide to approaching coma?

Quantity of Urine. In general, the quantity of urine excreted by the patient corresponded with the excretion of nitrogen and salt. It did not correspond with the sodium bicarbonate given. It would seem as if the factor which controlled the quantity of urine was the acidosis. When large quantities of sodium bicarbonate were given during the first period of starvation, the quantity of urine was in the neighborhood of 2200 c.c. During the days August 10 to 22, when no sodium bicarbonate was given, the quantity of urine was about the same. During August 23-27, when no sodium bicarbonate was given, but the acidosis was rising, with it rose the volume of the urine. When extreme doses of sodium bicarbonate were given, August 27-30, the volume of urine increased one-half. During the last period, however, when

the acidosis was extreme, the volume of urine was also high, showing the close relation between acidosis and volume of urine.

(To be continued.)

GUNSHOT WOUNDS OF THE THORAX.*

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DURING the term of service of the Harvard Unit at the American Ambulance (Hospital) in Paris, there were 441 admissions, of which 21 were wounds of the chest. We were fortunate enough to have for study among them examples of most of the important classes of thoracic lesions, such injuries as produced death either immediately or after a few hours being, of course, excepted.

The following brief consideration of such conditions as were illustrated by cases occurring during our period of service may be of interest.

Hemoptysis. So far as we could elicit from our patients, hemoptysis occurred in practically all; in some it was very small in amount and lasted only a short time; in others it was present for many days. In none, however, was there sufficient loss of blood to influence the patient's condition. Apparently in a few cases of thoracic injury, produced by a cleanly penetrating rifle bullet, it either did not occur or, what is more probable, was not noted by the patient. Desgouttes and Bressart¹ consider that the amount of hemoptysis is due more to the character of the missile than to any other cause.

Hemothorax. Hemothorax is more often produced by injuries of vessels belonging to the general than to the pulmonary circulation.

The vessels belonging to the general circulation which are particularly dangerous when injured, are the intercostal, the internal mammary arteries and veins, and the azygos veins. Throughout the greater part of their course, these vessels lie on the inner wall of the thorax, directly underneath the parietal pleura, and are surrounded only by a very small amount of connective tissue. The fact that these vessels are not surrounded by muscular tissue—which in itself possesses hemostatic qualities—into which they can retract, is one of the physical factors that militates against a speedy and firm clotting of the blood in the injured vessels. Also the blood shows no greater tendency to clot when it is in contact with the endothelial lining of the pleura than it does when in contact with that of the blood vessels.

In this connection, Toennissen² has studied the fluid in cases of hemothorax, and found that at first the fluid was dark red, with a cell count essentially similar to that of blood, but with fewer red cells and a higher percentage of

* Read at a meeting of the Boston Surgical Society, on Nov. 1, 1915.

eosinophiles. The fluid showed no tendency to clot in the pleural cavity or on its withdrawal. Gradually, after the vessel had finally stopped bleeding, the fluid became brighter red, with a decrease in the number of red cells, though the white cells remained about the same, or possibly slightly increased. The percentage of eosinophiles gradually increased, running up to as high as 70%. The fluid now, though showing no tendency to clot in the pleural cavity, did clot on withdrawal into an aspirating bottle. During the stage of absorption when the amount of fluid was decreasing, it became distinctly less hemorrhagic and sometimes almost entirely serous. At this stage it again lost its clotting power when it was withdrawn from the pleural cavity. Toenissen found this clotting phenomenon regularly in all the cases examined, and he adopts the explanation set forth by Penzoldt.³

Penzoldt pointed out that at first defibrinated blood was obtained. Later, as pleuritic irritation developed, an increase in leucocytes occurred, with the development of a new blood-clotting substance. If the fluid remained in the pleural cavity long enough, this clot-producing substance would again gradually disappear, synchronous with the disappearance of the pleural irritation. He felt that the eosinophiles developed locally, as they were not present in increased numbers in the circulating blood.

Sauerbruch⁴ has found in his studies of the cases in this war that bleeding from the lung tissue or the vessels of the pulmonary circulation does not last long. This is due either to the fact that there is almost immediate death from an injury to the primary pulmonary vessels or to the fact that in injuries of the lung tissue involving vessels of moderate size, the blood readily clots. Unlike the vessels of the general circulation, those of the pulmonary circulation are surrounded by a loose tissue which, on injury, with the production of either a hemo- or pneumothorax, contracts down upon the bleeding vessel. Furthermore, the lung tissue itself seems to possess a hemostatic action, probably because of the great amount of air contained in it and the peculiar arrangement of the alveoli, which would apparently readily favor the formation of a firm clot. Another point that is greatly in favor of the early clotting of blood about the injured vessel is the low blood pressure existing in the pulmonary system of vessels.

All those who have had experience with thoracic injuries insist that the most important principle in the treatment of hemorrhage is absolute rest, as thereby the blood pressure is lowered, and the most favorable conditions possible for the formation of a blood clot are produced. In this connection a case we had on our service is of particular interest.

LEON HACKERT. Serial No. 1399. Bed 309. Ward 225. Age, 22. Admitted April 4, 1915. Discharged May 20, 1915, good condition.

Diagnosis. Perforating rifle wound, chest.

History. Wounded March 13, while leaving trench at Zillebeke, Belgium. Rifle bullet entered left shoulder posteriorly, which knocked the patient over. He spat up blood immediately, became very weak, but not unconscious. He had worn his clothing for 7 months, though he had changed his linen 8 days previously. Had not had a bath for 3 months. Condition of the trenches was very muddy. Immediate dressing by brancardiers (stretcher-bearers) and carried to the Poste de Secours one and one-half hours later, where he remained for 12 days. He was then sent to Poperinghe, where he stayed 8 days. Bullet was removed from under the skin on the front of the chest without anesthesia. Has had two dressings in the last 20 days. Spat up blood continuously until March 21. No cough; no dyspnea. Difficulty in lifting left arm.

Examination. Poorly developed and poorly nourished, with marked pallor, and breathing rapidly. Small, crusted, nearly healed bullet wound of entrance in left posterior axillary line, one inch below base of acromion. Linear incision 1 cm. long in mid-sternal line at junction of manubrium and gladioli nearly healed. Entire left chest anterior and posterior showed absence of voice and breath sounds. Well marked Grocco's sign. Heart markedly displaced to the right. Patient unable to abduct left arm more than 45°.

NOTES.

April 5. Hemoglobin 52%—Sahli. W.B.C. Differential count: polymorphonuclears 63%, mononuclears 4%, lymphocytes 26%, transitionals 2%, eosinophiles 5%.

April 7. Patient's temperature is running between 102 and 103°. Fairly comfortable excepting for his dyspnea, which is apparently more marked than on entrance.

April 7. Operative Note.—Under local anesthesia a small skin incision was made and a trocar introduced to the 6th space in the anterior axillary line. 1800 c.c. of dark blood removed, which did not clot in the bottle. (Dr. Boothby.)

April 12. Temperature down. Patient very comfortable.

April 15. Wounds in chest and back entirely healed. Heart seems to have swung back almost to normal position. Signs of fluid in chest are still present, almost as marked as before operation. (Dr. Rogers.)

May 10. Patient up and about. Temperature normal. Chest condition much improved. No improvement in the abduction of left arm, due to circumflex paralysis.

May 20. Temperature perfectly normal. There is still dullness in the left chest, which is probably due to a thickening of the pleura or beginning fluid. Discharged in good condition. (Dr. Rogers.)

From a study of the history of this case, it is evident that during his stay at the hospital at Poperinghe, bleeding had stopped. The exertion involved in the railway journey to Paris, together with the several ambulance transportations connected with the evacuation, started up again a slow bleeding, probably in the intercostal vessel injured by the bullet as it entered the chest in the posterior thoracic region. On account of this persistent bleeding, the intrathoracic pressure gradually increased, necessi-

tating aspiration to relieve dyspnea. Sauerbruch⁴ states that late bleeding is very apt to occur from 8 to 14 days after injury. He believes that at least 14 days should elapse before a long transportation can be made with reasonable safety.

Simple hemothorax was found by Toenniessen² to occur in 23 out of 56 cases (41%) sent to the medical service at a base hospital. Rotter³ found a clinically demonstrable simple hemothorax in 46 out of 115 cases (40%) of perforating wounds of the thorax treated in a field hospital. Unterberger⁶ reports that he found a large hemothorax in 28 out of 63 cases of chest wound (43%).

Bradford and Elliott⁷ have carefully correlated the data obtained from all chest wounds that passed through Boulogne from November, 1914, to July, 1915. It is a most interesting and instructive report.

Out of 84 bodies with chest wounds on which a post-mortem was performed, they found 69 had an effusion of blood into the pleural cavity; 23 died of complications, such as purulent bronchitis, paraplegia, or abdominal lesions; 46 died simply from the hemothorax, but in 38 of these the effusion was infected, and in only one case could death, which occurred on the third day of the injury, be definitely ascribed to the hemorrhage.

Clinically they grouped their cases into two divisions: Group A, from November to the week of Neuve Chapelle in March, includes even the mildest cases:

- 168 Cases of hemothorax and also 27 cases of injury of the lung without effusion.
- 114 Cases sterile; of these 48 had such large effusions that aspiration was done.
- 28 Infected effusions which survived resection of rib;
- 20 Deaths (infection).

Group B, from March to July, includes only the more severe cases:

- 160 Cases of hemothorax.
- 86 Cases remained sterile; of these 41 were aspirated.
- 53 Cases became infected and survived resection of rib.
- 21 Deaths, in which 16 were infected.
- 1 Death from simple hemothorax.

These statistics indicate that infection, and not hemothorax, is the greater danger. They advise, therefore, a delay of a few days only at the earliest possible resting place; as a rule, after three days, the patient should be taken as quickly as possible to a base hospital, where there are facilities for the diagnosis and operative treatment of an infected effusion.

Hemothorax is obviously a most frequent complication. However, many cases show no fluid in the pleural cavity, or at least not of sufficient amount as to be recognized by the necessarily rapid examination of an active military hos-

pital. It is probable that a hemothorax is less likely to occur if there are strong pleural adhesions holding the lung in apposition to the thoracic wall. It is doubtful if sufficient intrapleural pressure—in the absence of strong adhesions—is ever developed, capable of stopping, or even decreasing, hemorrhage, as a rise of the pressure within the thorax of a very few millimeters of mercury will cause the respiration to become very much embarrassed, and will not be sufficient to influence the bleeding.

Various authors show a considerable discrepancy in their opinion as to the advisability of aspirating a simple hemothorax. This discrepancy seems to be due to the conditions under which they work. If they are in a position carefully and aseptically to aspirate the chest, it seems an advisable procedure, as thereby the disappearance of the fluid is hastened, with probably less likelihood of the formation of dense pleuritic adhesions. However, it is readily conceivable that in many military hospitals absolute certainty of an aseptic aspiration would not be possible. The difference in treatment would seem dependent, therefore, on the ability under given conditions to perform the aspiration with absolute asepsis. If only relative or poor asepsis is obtainable, the operation should be performed only under extreme conditions of intrathoracic pressure, or for diagnostic purposes, when the temperature indicates the possibility that the pleuritic effusion has already become infected. The temperature curve in the presence of a large hemothorax does not necessarily mean an infection, as is illustrated by our own case, because the absorption of the blood, together with the respiratory embarrassment and mental worry can readily cause an irregularly elevated temperature. However, the safe procedure would be to aspirate all cases of irregular temperature, and if pus is found, to do a thoracotomy.

Many writers, among them Sauerbruch,⁴ recommend that in case aspiration be done, only a small amount of fluid (20-30 c.c.) should be removed at each aspiration. They state that this amount is sufficient to relieve the pressure symptoms temporarily, and if they recur, aspiration can be repeated. The reason for this recommendation is the danger that the withdrawal of a large amount of fluid will so lower the intrapleural pressure that hemorrhage will recur. This reasoning is correct if an aspirating bottle is used, in which a negative pressure of considerable amount has been produced by a pump. With such an apparatus, conditions can readily be conceived in which withdrawal of more than a small amount of fluid would produce within the chest a negative pressure equal to that existing in the bottle. For instance, if the lung is bound down by adhesions, or has been in great part destroyed, it may be necessary to leave a large amount of fluid in the chest to take the place of the non-expandible or destroyed lung. In such cases if attempts were made to withdraw a large

amount, then the dangers of a high and unknown negative intrathoracic pressure would be produced. Therefore it is better to use a simple aspirating needle, to which is connected a rubber tube about 30 cm. long, the whole of which is filled with sterile water, and the distal end immersed in a basin of sterile water. This would produce, when the needle is inserted into the pleural cavity, a suction equivalent to the difference in the level between the surface of water in the basin and the level of the needle. This difference in level can readily be varied from zero up to a limit of 30 cm. It would be perfectly safe with an apparatus of this kind to allow as much of the fluid in the pleural cavity to flow out as would do so of its own accord. If very thick pus is present, a greater negative pressure may sometimes be necessary to insure its passage through the needle. For diagnostic purposes, then, a small hypodermic syringe, as recommended by Murphy,⁸ with a sufficiently long needle of large bore should be used. Care should be taken, however, not to remove more than one or two cubic centimeters of fluid by the strong suction of the syringe. Simple forms of apparatus of the kind suggested above, are readily available, even in the most poorly supplied field hospital, and are far safer than more expensive and highly complicated forms that are so often used.

Pneumohemothorax. Very frequently a small amount of air can be demonstrated as existing above the level of the fluid. The air in itself does not complicate the condition, unless it remains in communication with a bronchus, in which case the dangers of infection of the pleural cavity are increased. The air usually disappears very rapidly if there is no permanent communication with the bronchus.

Tension Pneumothorax. A condition called by the Germans "Spannungspneumothorax," can occur from a valve-like formation of either the entrance or exit wound in the thoracic wall, or of a similar formation around one of the larger bronchi. This means that during inspiration more air enters the pleural cavity than leaves it during expiration. The amount of pressure that develops within the pleural cavity depends on the efficiency of the valve-like action of the flap. Occasionally an extreme degree of dyspnea can be developed, which may even result in death. The clinical picture produced by intrathoracic pressure is very characteristic, and when known, readily appreciated. It, however, can be easily mistaken for pneumonia, as the patient may present many of the symptoms of that disease, such as elevated temperature and rapid respiration. However, instead of having a flushed face, he is more likely to be pale and his air hunger to be greater. Depending on the relative proportion between the blood and the air in the pleural cavity, there will be a varying area of dullness and of tympany. During our service we had one case of extreme tension pneumohemothorax, and we fell into the error

of considering it pneumonia. The patient's history is as follows:

ALAIN DAVALAN. Serial No. 1671. Bed 443. Ward 226. Age 36. Admitted April 28, 1915. Discharged May 5, 1915—dead.

Admitting Diagnosis. Wound in left shoulder caused by *célat d'obus*. Infected hemothorax? Pneumonia?

History. Wounded April 26, 10.00 a.m., near Ypres. First dressing at Berghes, where an operation was undergone, followed by violent hemorrhage. The fragment from the *célat d'obus* penetrated four layers of clothing. At the operation no foreign body was found, probably because of the violent hemorrhage, which was stopped by packing.

Examination. Patient in good physical condition, but very weak, groaning on slightest movement. Pain in left shoulder and chest. In left shoulder at the edge of the trapezius is a wound 10 cm. long and 3 cm. wide, packed tight with iodoform gauze. In the operating room gauze was removed after an hour's work, revealing a wound 10 cm. deep, extending into the thorax, and absolutely dry. Dry sterile dressings were applied. Temperature 101.4°, pulse 140, respirations 30-40.

NOTES.

May 1. Right chest normal except for exaggerated breathing. Left chest in front, when patient is lying on back, shows some dullness to third rib, becoming flat in axilla. Heart is pushed to the right; right border is 5 cm. to right of mid-sternum at fourth rib and heart sounds much more distinctly heard at heart line than at left nipple. Breath sounds on left are slightly diminished and bronchial in character, as is the voice. With the patient on right side, region around the heart is much more resonant, showing a shift of dullness, probably fluid. Back is dull from mid-scapula down, with diminished breathing, not so bronchial in quality. No Grocco's sign. (Dr. Rogers.)

May 2. Tympany at apex in front and extending down over cardiac area, also in back down to mid-scapula. The position of the heart could not be made out on account of this tympany. The breath sounds are almost absent over this area as well as almost flat. Impression—evidently a pneumohemothorax. (Dr. Rogers.)

May 4. Temperature 98.2°. Pulse 120 and better quality. Respirations 26. In spite of this improvement in temperature and pulse, patient has become more and more uncomfortable because of distention with gas, collecting mostly in the epigastrum, aggravating a shortness of breath. Turpentine stupes, enemata, all kinds, and atropin did not relieve this distention.

May 5. Respiratory difficulty grew worse during the day and patient refused all nourishment. Very restless. Distention somewhat less. It was felt that the wound had penetrated from the shoulder into the pleural cavity and that there was a hemothorax, above which was a considerable amount of air in the pleural cavity. When doing the dressing, it was noticed that air now and then seemed to suck into the pleural cavity. For this reason we felt it would be of no value to tap the chest, since atmospheric pressure existed within the thorax. The patient's condition was not strong enough to stand any manipulation. Pulse and circulatory system continued strong up to the end. Great embarrassment due to distention was an added factor. (Dr. Cutler.) Patient discharged dead May 5.

This case is one of great interest, and is most instructive. The patient entered the hospital during a busy morning, and the diagnosis of pneumonia was hurriedly adopted. Bradford and Elliott⁷ point out that very frequently a large hemothorax is mistakenly diagnosed as a pneumonia on account of the following combination of symptoms: fever, dyspnea, tubular breathing and decreased mobility of that side of chest; these mimicking physical signs are due to the extreme collapse of the lung. They have never found unequivocal proof of pneumonia occurring on the side of a collapsed lung.

The determining sign is, therefore, the position of the heart; if the heart is materially displaced then the symptoms suggesting pneumonia are really produced by fluid over a collapsed lung.

Later careful examination by Dr. Rogers, the medical consultant, showed the presence of a large hemothorax, over which there was a progressively increasing pneumothorax. Moreover, the surgical resident, when dressing the wound, noted that air was sometimes sucked into the pleural cavity on inspiration. The data in this case, both on the medical and surgical side, are thus clear as to fact, but they were misinterpreted on the ground that if air entered the pleural cavity the intrathoracic pressure could not exceed that of the atmosphere, and therefore would not be more dangerous than an ordinary open pneumothorax. This interpretation of the findings was based on a failure to appreciate the pneumodynamic action of the valve-like opening that existed at the base of the deep wound, through which air entered the cavity during inspiration, but could not flow out during expiration. The prolonged continuance of this process resulted in more and more air accumulating in the pleural cavity, with a corresponding displacement of the mediastinum to the uninjured side, and of the thoracic wall and diaphragm respectively outward and downward. Finally, when no further compensatory displacement was possible, the patient died of inability to contract down the chest sufficiently to reinspire.

A further complicating element in the correct diagnosis of this case lay in the distention of the abdomen. The attention of the staff was directed towards attempts to relieve this abdominal distention. It is more than probable that the distention observed was only in a minor degree the result of a true abdominal collection of gas of reflex origin, but was largely due to the contraction downwards of the diaphragm in a compensatory effort to overcome the tension pneumothorax. Autopsy showed the pleural cavity contained over two liters of blood, and that the lung was in greater part destroyed. The autopsy was not conducted in such a manner as would demonstrate the existence of a tension pneumothorax. There were no abdominal lesions.

Cardiac Injuries. Any injury of the heart must, from the military point of view, be treated by absolute rest, with sufficient morphia to render the patient drowsy. Practically speaking, immediate operation is almost invariably impossible. If recovery occurs from the immediate effects, then, in those cases where the bullet still remains in the pericardium or heart, operative measures can be considered after the patient has reached a completely equipped base hospital. The service that had charge of the University division just before the Harvard Unit came on duty, removed by operation, a bullet that lay free in the pericardial cavity. An empyema occurred as a complication of convalescence from this operation, but the patient made a good recovery and was discharged in excellent condition.

Infection. Practically all cases, in which the opening into the pleura remains patent, become infected.

Bradford and Elliott,⁷ on the basis of the careful study of 328 cases of closed hemothorax, estimate that about one-third of such cases become infected. A great deal depends on the character of the missile, the condition of the patient's skin and clothing, and at what point on the line of evacuation the observer is located. Unterberger⁸ had 3 out of 28 cases of hemothorax that developed into empyema and in which thoracotomy was performed; Rotter⁹ had 2 empyemas develop from 43 cases of hemothorax. Tuffer⁹ states that when infection occurs, it is generally due to the presence of a foreign body, or else in wounds caused by a bursting shell.

Reiche¹⁰ and Ritter¹¹ both cite several cases in which the extrathoracic part of a perforating wound became badly infected without extension of the infection to the pleural cavity. They were surprised to find how quickly the pleural opening would close of itself and prevent infection from the superficial wound later suppurating. They believed, therefore, that the resistance of the pleura to the infection was very great. This view does not seem to me correct, as it is opposed to most clinical and experimental evidence. What their data do show, however, is that the pleural membrane, together with the extrapleural fibrous tissue, is very resistant to the passage of an infection from its extrapleural to its intra-pleural surface. Obviously, care must be taken not to open the pleura in cases of large septic hematomas that develop extra-pleurally and are not connected with the pleural cavity.

Patients with wound of the chest that have an irregularly elevated temperature, should be aspirated; if pus is found, thoracotomy should be performed. In order that the development of an open chronic empyema be as infrequent as possible, the thoracotomy should be done at the dependent point of the pleural cavity, and should be large enough to admit the hand, so that a thorough exploration can be made and all

foreign bodies removed. Marion¹⁴ was surprised at the ease with which intrapulmonary projectiles could be removed in all but one of twenty-seven cases.

Abdominal Symptoms. It is no uncommon accident in general surgical work to open the abdomen and remove a normal appendix, and the next day find a well-developed pneumonia or infected pleuritic effusion. In fact, it is necessary to be on guard against the referred pseudo-abdominal symptoms caused by an irritative thoracic lesion. The same class of referred symptoms may develop from wounds of the chest. Borchard¹² cites a case of referred pain with abdominal distention and spasm, independent of any injury to the abdomen. Bottner¹³ saw 4 cases, of which 2 had entrance and exit wounds in the thorax above the level of the dome of the diaphragm, while in the other 2 there were only wounds of entrance. Therefore in the latter cases the course of the bullet was unknown, and injury of the diaphragm could not be eliminated, and in consequence the differential diagnosis of an abdominal complication was very difficult. One case was operated on and a liver abscess found; the patient, however, died. In the other, no operation was performed, and the abdominal symptoms gradually improved and disappeared in 6 days. The two cases with both an entrance and an exit wound above the dome of the diaphragm showed typical intercostal reflex phenomena of the corresponding muscular segment, together with an area of anesthesia anterior to the wound. He gives the following history of one of these cases:

"Weak, pale young man with sunken eyes. Entrance wound 3 cm. beneath right nipple; exit wound just below angle of scapula near 10th spinous process. Large effusion. Dyspnea. Abdomen markedly distended, fairly rigid and tender, especially in right upper quadrant. Temperature normal. Pulse regular and good quality. No stool and no urine. Patient observed every 10-15 minutes, by which it was noted that the abdominal symptoms varied somewhat from time to time. Next morning spontaneous urination and defecation. Improved during the day, and the abdominal symptoms nearly disappeared during the next night."

The abdominal symptoms in our patient, Alain Davalan, previously cited, were very similar to this case of Bottner's, and were probably, in part at least, due to a similar abdominal reflex. The abdominal distention in his case was emphasized by the compensatory action of the diaphragm in attempting to overcome the valve-like action of the entrance wound into the pleural cavity.

Nerve Lesions. Wounds of the upper part of the thorax in the region of the clavicle are very apt to injure some part of the brachial plexus. Therefore paralytic and sensory disturbances of the arm should be looked for as a matter of routine. Only when the patient reaches a permanent base hospital, with proper facilities,

should the question of nerve freeing or nerve suture be considered.

Injury of the sympathetic system is probably quite common. If it occurs in the upper third of the thoracic gangliated cord, or involves the inferior cervical ganglion (situated just behind the clavicle), probably the stimulative ocular symptoms would be manifested, such as narrowing of the lid and pupil, together with a retrogression of the bulb. An interesting case of this type, in which a probable diagnosis could be made, occurred in our service.

The phrenic, vagus and recurrent laryngeal nerves are in such close relationship with the big vessels that probably any injury of them would result in nearly immediate death from hemorrhage.

SUMMARY.

1. Intra-thoracic hemorrhage is most likely to cease with the patient at absolute rest; therefore he should be kept in bed (under morphia, if necessary) at the first available station.

2. Symptoms rapidly developing, suggesting pneumonia with marked dyspnea, are probably due to the production of a large hemothorax or a pneumo-hemothorax. Such cases should be aspirated and sufficient fluid withdrawn to relieve the dyspnea. Care should be taken not to produce a negative pressure within the thorax by the use of an aspirating bottle. A simple needle with rubber tube 30 cm. long, filled with sterile water, and the open end immersed in a basin of sterile water, will produce as great a suction as it is safe to use. With such an apparatus, as much fluid can be withdrawn as will run out of its own accord.

3. After three days the danger of infection exceeds that of hemorrhage. Therefore, if the patient is not in a place equipped for diagnosing and operating for empyema, he should be evacuated to the nearest hospital so equipped, and kept there for at least two weeks before further evacuation.

4. Whenever the patient presents an irregularly elevated temperature, exploratory aspiration with a small hypodermic syringe, armed with a long needle of large bore, should be performed.

5. Whenever the pleural fluid is found infected, a long thoracotomy opening should be made and free drainage instituted.

6. If the patient is in a dangerous condition, prolonged search for the presence of a foreign body should be deferred. However, all foreign matter should be removed as soon as possible in order to hasten the final closing of the wound.

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HOW CAN WE DETECT SLIGHT ENLARGEMENT OF THE HEART?*

By GEORGE CHEEVER SHATTUCK, M.D., BOSTON.

IF WE are to detect slight cardiac enlargement, by which I mean an increase of two or three centimetres in the transverse diameter of the heart, the first essential is an adequate standard of the normal.

It is generally agreed that the x-ray, when rightly used, is the most reliable means of measuring the heart. By its aid Moritz,¹ Dietlen,² Veith,⁷ Groedel,⁸ and Claytor and Merrill¹⁰ have prepared tables of normal heart-size.

Moritz's work was soon followed by that of Dietlen, his assistant, who amplified it, and prepared new tables based on a larger number of cases. Veith's tables are for children only, and to discuss them here would be to exceed the scope of this paper. These three men worked with their patients in the horizontal position. Groedel subsequently prepared tables from patients sitting. The figures in all of these tables are based on orthodiagraphic tracings.

The patients of Dietlen and of Groedel were divided into four classes, namely, men, youths, women, and girls; and these classes were subdivided into groups based on stature, the difference between each group and that succeeding it being five centimetres. Dietlen's tables show also the average weight and average age of the patients in each group.

All of the tables have been published in full by Albers-Schönberg;¹² and Groedel⁹ published the tables of Veith and of Dietlen but omitted the weights and ages from the latter. An average, a minimal, and a maximal figure is shown for every group in all tables.

A considerable number of heart-measurements are figured in the tables of Dietlen. Groedel tabulated only the four which seemed to him of special value, namely, the greatest distances from the median line to the right horizontally, a similar measurement to the left, the sum of

these which is the transverse diameter, and the length, measured from the apex to the angle formed by the junction of the curve of the great vessels with that of the right border. These four measurements are designated respectively as "MR," "ML," "T," and "L" (Fig. 1).

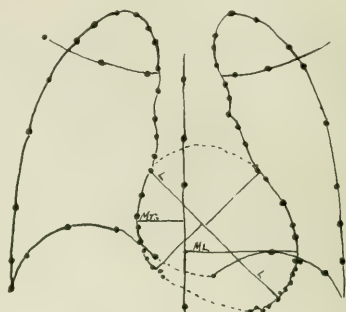


FIG. 1.

Orthodiagraph of the heart showing method of measurement. Dietlen: Verhand. d. Cong. f. inn. Med., Vol. 23, p. 268, 1906.
 "MR" — width to right of median line.
 "ML" — width to left of median line.
 "T" — length.
 "L" — "MR" plus "ML".

Groedel's figures are not strictly interchangeable with those of Dietlen as a standard of heart-size because Groedel examined his patients sitting and Dietlen's were horizontal, and it is known that the position of the heart varies with that of the body. Groedel's "MR" in the various classes averages about one centimetre larger, and "ML" about 0.5 centimetre smaller than Dietlen's (Fig. 2). Apparently, in patients

FIG. 2.

AVERAGES FOR GROUPS OF GROEDEL AND DIETLEN.

	MR.		ML.		T.		L.	
	G.	D.	G.	D.	G.	D.	G.	D.
Men	4.6	4.3	8.4	8.9	13.0	13.2	14.0	14.2
Youths	4.1	3.9	7.8	8.0	11.9	11.9	12.7	13.6
Women	3.9	3.6	8.0	8.5	11.9	12.1	12.9	13.2
Girls	3.7	3.5	7.2	7.8	10.9	11.3	12.1	12.8
Av. of four groups ..	4.7	3.8	7.8	8.3	11.9	12.1	12.9	13.2

sitting, the heart lies more to the right than when the patient is in the horizontal position.

Albers-Schönberg¹² quotes various authors who found that the heart-measurements in standing were smaller than in lying and attributed this to descent of the apex in standing. No careful comparison has been made of the position of the heart between sitting and standing so far as I know. As a rule, however, the differences between sitting and lying are not great, being, generally less than one centimetre. Drs. Walter J. Dodd and George W. Holmes, however, have found marked differences in the presence of visceral ptosis.

Claytor and Merrill's figures for the erect position are smaller than those of Dietlen or of Groedel (Fig. 3). The differences for "MR,"

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FIG. 3.

CLAYTOR AND MERRILL'S TABLE VII: MEN AND WOMEN.

	MR.		ML.		T.		L.	
	M.	W.	M.	W.	M.	W.	M.	W.
Dietlen ...	4.3	3.6	8.9	8.5	13.2	12.1	14.2	13.2
Groedel ...	4.6	3.9	8.4	8.0	13.0	11.9	14.0	12.9
C. and M. ...	4.0	3.4	8.1	7.8	12.1	11.1	13.7	12.5

for "ML" and for "L" are slight, but "T" for both men and women is about one centimetre smaller. The fact that Claytor and Merrill's tables are based upon weight groups instead of stature groups is no reason why the average figures should differ, and the difference seems most easily explained on the ground of the difference of position of their patients and consequently of shape and measurement of the hearts, which will be further discussed below.

Comparison of average transverse diameter, or "T" for adult men and women (Fig. 3) shows that men's hearts are one centimetre wider. The length, also, averages one centimetre greater in men.

Differences far greater than these are found when the maximal and minimal measurements of a single height-group are compared with each other. Sometimes the average "MR" or "ML" for men of one height group is larger than that for the first, or even for the second, succeeding height-group as may be seen in Groedel's Table (Fig. 4) which is reproduced below. It shows that the maximal and minimal figures for "MR" in man differ by 2.1 centimetres, and those for

"ML" by 3.0 centimetres, and those for "T" by 3.2 centimetres.

Further comparison shows that the minimal "MR" is in the second group and the maximal in the third. Both maximal and minimal figures for "ML" are in the third group and the same is true of "T." Clearly, then, the maximal and minimal figures for these groups do not increase progressively but very irregularly with the stature of the patient. Still more important is the fact that the *average measurements* in the four groups do not increase progressively. The average "MR" in the first group is the same as that in the fourth; and that in the second, which is smaller, equals that in the third. "ML" shows similar discrepancies, and the average figures for "T" in the four groups for men are almost exactly the same.

It seems, therefore, that the tables of Groedel are valuable for providing maximal, minimal, and average figures of normal heart-size, but that the relation of the figures to stature is not clearly apparent. Groedel's other tables are open to similar criticism, and so are the tables of Dietlen.

Groedel¹ himself criticized the tables on the ground that the material in hand was too small, and he seems to have attributed the discrepancies to this fact.

Dietlen's tables were based on the largest material, comprising 156 men, 31 youths, 58 women, and 17 girls.

It seems to me that Groedel² failed to empha-

FIG. 4.

ORTHODIAGRAPHIC MEASUREMENTS. (GROEDEL)

For Men Sitting

Height.	Mr.	ML.	T.	L.
I. 145-154 cm.				
Min.	*4.0	*8.0	*12.0	(Min.) *12.0
Av.	†4.7	†8.4	†13.1	12.9
Max.	‡5.2	‡9.2	‡14.4	†14.2
II. 155-164 cm.				
Min.	(Min.) *3.5	*7.4	*12.1	*13.0
Av.	†4.5	†8.7	†13.0	13.9
Max.	‡5.3	‡9.5	‡14.1	†15.0
III. 165-174 cm.				
Min.	*3.7	(Min.) *7.2	(Min.) *11.4	(Min.) *12.0
Av.	†4.5	†8.7	†13.2	14.0
Max.	(Max.) ‡5.6	(Max.) ‡10.2	(Max.) ‡14.6	(Max.) ‡15.3
IV. 175-185 cm.				
Min.	*4.0	*7.3	*12.0	*13.3
Av.	†4.7	†8.5	†13.2	14.2
Max.	‡5.4	‡9.0	‡13.6	†14.7

For Women Sitting.

I. 145-154 cm.				
Min.	(Min.) *3.0	(Min.) 6.2	(Min.) 10.1	(Min.) 11.0
Av.	†3.8	†8.0	†11.8	†13.0
Max.	‡4.5	9.3	13.1	13.5
II. 155-164 cm.				
Min.	*3.2	6.4	10.4	11.5
Av.	†3.8	†8.0	†11.8	†13.0
Max.	(Max.) ‡5.0	9.5	(Max.) *14.3	(Max.) *14.8
III. 165-174 cm.				
Min.	*3.2	6.5	10.8	12.0
Av.	†4.0	†8.1	†12.1	†13.2
Max.	†4.5	(Max.) 9.8	*14.0	*14.5

* † ‡ Note that most of the minimal and maximal figures are near the middle of the table. Compare figures with others similarly checked in the same column.

size the main fault of the tables, namely, that they should have been based *not on stature, but on weight*.

That weight is the greatest factor in determining heart-size was clearly shown by Dietlen² (Tables 6, 7, 8, and 9). In Tables 10 and 11 he showed that heart-size has no necessary relation to stature, and this is borne out by the discrepancies in Groedel's table mentioned above. Heart-size seems only to follow stature when the body weight is proportional to stature. (Fig. 5). Dietlen² gives further evidence of the importance of weight in determining heart-size by quoting the anatomical work of Thoma and Muller.† It seems strange that men who recognized the preponderant effect of body-weight should have arranged their tables by stature-groups instead of by weight-groups (Fig. 5).

FIG. 5.—FROM DIETLEN'S "TABLE 6."

Body-weight Kg.	No of Cases.	Av. Stature	Av. Age.	T.	L.
40-44	7	152	26	11.3	12.1
45-49	5	159	20	11.4	12.9
50-54	27	161	27	12.4	13.5
55-59	39	164	30	12.9	14.0
60-64	54	167	26	13.1	14.1
65-69	24	169	30	13.2	14.5
70-74	18	174	31	13.4	14.8
75-79	5	179	22	14.3	15.5
80-84	5	185	25	14.4	15.3

† Note the progressive and gradual increase of size, the only exception being the last two figures in the second column. The number of cases on which these last figures are based, however, is very small.

Dietlen² raises an objection to weight which may be important, namely, that after the age of forty both weight and height diminish in some cases and that nevertheless the heart continues to increase in size. Fig. 6 indicates this, but the number of cases on which the table is based

† Muller: *Massenverhältnisse des Menschlichen Herzens*, 1883.

is too small to allow of safe deductions. If the heart-measurements do really increase after

FIG. 6.

DIETLEN'S TABLE 15.

Ages.	No. of Cases.	Av. Wt.	Av. Size.	Mr.	Ml.	T.	L.
15-19	31	54	162	3.9	8.0	11.9	13.6
20-29	32	62	168	4.3	8.6	12.9	14.2
30-39	17	64	169	4.2	8.7	12.9	14.2
40-49	12	61	167	3.9	8.9	12.8	14.1
50-59	13	62	167	4.1	9.1	13.2	14.4
60-69	7	59	167	4.4	9.0	13.4	14.4

Note that with slight differences of weight and of stature there is, on the whole, an increase of heart-size with advance in years, but that it is less pronounced after 40. The number of cases, however, is too small to allow of safe deductions.

forty independently of weight, two factors, or either alone may be causative: first, loss of elasticity in the arteries; second, sinking of the right side of the heart, the apex remaining relatively high, so that the heart assumes a more horizontal position. Such a change of position is common in the elderly, and it increases the transverse diameter of the heart without changing its actual size, but there may be hypertrophy also, and, within limits, this may be considered physiological rather than pathological, just as is the gradual increase of blood-pressure which goes with advancing years.

In summarizing the foregoing it may be said (1) that heart-size is dependent first on body-weight, and second, apparently on age, and that stature *per se* is not important; (2) that tables of heart-size based on stature are unsatisfactory.

The tables of Clayton and Merrill, (Fig. 7), are based on weight as they should be. Their table for men is divided into six groups. The first four groups ascend by ten pounds and the last two by twenty pounds. That for women ascends by ten pounds in six groups, and in the seventh by fifteen pounds. The maximum weight

FIG. 7.

CLAYTON, MERRILL: ORTHODIAGNAPHY.

Vertical Heart Orthodiagrams. Male (37 Cases.)

Weight. Pounds.	Cases.	Mr. (Min.)	Ml. (Min.)	T. (Min.)	L. (Min.)	Min. Av. Max.
120-129	3	3.2 3.7 4.3	7.0 7.2 7.5	10.7 10.9 11.3	11.8 12.6 13.5	Min. Av. Max.
130-139	5	*3.5 3.8 4.2	7.5 8.0 8.5	11.0 11.8 12.5	12.0 13.2 14.0	Min. Av. Max.
140-149	9	*3.4 4.0 4.6	(Min.) 7.0 7.7 8.4	11.0 11.9 *13.1	12.0 13.4 14.5	Min. Av. Max.
150-159	8	(Min.) *3.2 3.9 4.5	7.8 8.4 9.0	11.5 12.3 *13.0	12.5 13.5 15.0	Min. Av. Max.
160-179	6	3.7 4.0 (Max.) 4.8	8.0 8.2 9.0	12.0 12.4 (Max.) *13.8	14.0 14.6 (Max.) *15.8	Min. Av. Max.
180-200	6	3.8 4.2 4.5 (Max.)	(Min.) 7.0 8.7 9.7	11.0 12.9 *13.4	14.0 14.7 *15.3	Min. Av. Max.

VERTICAL HEART ORTHODIAGRAMS. FEMALE (54 CASES.)

		||3.2 †3.3 *3.5	||6.7 6.8 7.0	||9.9 10.2 10.5	||12.0 †12.1 12.3	Min. Av. Max.
100-109	2					
110-119	3	||3.0 †3.1 *3.2	||7.0 †7.6 8.0	||10.0 10.7 11.1	||11.5 †11.9 12.4	Min. Av. Max.
120-129	14	(Min.) ||2.3 †3.5 *4.2	(Min.) ||6.4 †7.5 8.6	||10.2 11.0 *12.2	(Min.) ||10.5 12.2 *13.8	Min. Av. Max.
130-139	19	||3.0 †3.4 *4.0	||6.4 7.8 *8.8	(Min.) ||9.6 †11.2 *12.6	||11.2 12.4 *13.3	Min. Av. Max.
140-149	5	||2.6 †3.5 *4.1	||7.0 †7.6 *8.3	||10.0 †11.1 *11.8	12.2 †12.7 *13.2	Min. Av. Max.
150-159	7	||3.1 3.6 (Max.) *4.8	||7.6 †8.0 (Max.) *9.3	||10.9 11.6 (Max.) *12.8	||12.3 †12.9 (Max.) *14.2	Min. Av. Max.
160-175	4	3.5 3.8 3.8 *4.1	||6.5 †7.9 8.5 *9.0	||10.6 11.7 12.3 (Max.) *12.8	||11.8 †12.6 13.0 *13.2	Min. Av. Mean Max.

* † || Note the situation of the minimal and maximal figures, and compare figures with others similarly checked in the same column.

for the women is one hundred seventy-five, and for the men, two hundred pounds. Unfortunately, the material of these tables comprises only thirty-seven men and fifty-four women. They show irregularities like those in Groedel's tables but less in degree. Dietlen's weight table (Fig 5) indicates that the irregularities of Claytor and Merrill are to be attributed chiefly to insufficient material. Figures 2, 3, and 4 of Claytor and Merrill's paper show curves indicating the relation of increase of heart-size to body-weight (Fig. 8). For this purpose they used

crease of heart-size in men up to 128 pounds of body weight, and after that the increase is more gradual. In the higher weights the increase is very slight. The increase in women was found to be less marked.

There are still other factors influencing heart-size or heart-measurements which should be mentioned.

Occupation may be important, but its effect probably follows weight in most cases because the well-developed and muscular are heavy, and the sedentary are generally fat, whether they be men or women.

The phase of heart action, according to Groedel,⁹ may cause a difference in extreme cases of 0.5 cm. for both borders. He estimates the normal change at about 1.8 cm., but thinks this figure still too high for most cases. It seems, therefore, that the difference of measurement between systole and diastole is negligible as compared with other variations, and yet, to avoid doubt, orthodiagrams should be made in diastole, and it is probably better to use an exposure of not less than one second for teleoroentgenography than a shorter period, (if plates sufficiently clear for measurement can be so obtained) in order to show the heart outline in diastole.

Posture, already mentioned, seems to be relatively unimportant in its effect on heart-measurement except when there is marked visceral ptosis. It may be said in general that in standing, the heart apex rotates downward around the base as an axis. "MR" is generally about 1 cm. greater, and "ML" about 0.5 cm. smaller in the sitting than in the horizontal position, and the differences between standing and lying are probably similar.

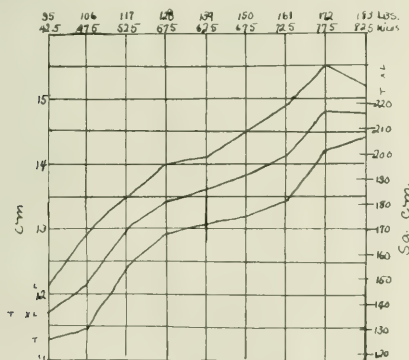


FIG. 8.
Claytor and Merrill's Fig. 4.
(Based on Dietlen's Table 6, see Fig. 5.)

curves of "L" and "T" and of the square area of the orthodiagram. They found that 70% of "T" x "L" gave a close approximation of the square area as obtained by careful measurement. The authors pointed out that there is a rapid in-

The measurement of length, designated "L," is sometimes valuable because it is very little affected by such rotation. As a useful figure for heart-size "L" suffers, however, from the fact that the angle above mentioned may be ill-defined, and that the lowest part of the apex lies below the diaphragm and may be obscured by the shadow of the left lobe of the liver.

The shape of the heart, and consequently its size, is dependent, I believe, to a considerable degree on that of the chest, long narrow hearts being the rule in long narrow chests, and vice versa. The "small heart" in the paralytic thorax has been attributed to tuberculosis, but Wesler¹⁵ pointed out that it was narrow rather than small, and was caused not by tuberculosis but by the narrow chest and low diaphragm.

The position of the diaphragm seems to be the greatest single factor influencing the position of the heart, and therefore, it has an important bearing on shape and measurement. The narrowest hearts are seen with low diaphragm and visceral ptosis, and wide normal hearts with high diaphragm, whether this be due to tight corsets, abdominal distention, or to other causes.

The usual position of the diaphragm in standing, except when temporarily displaced, has a fairly constant relation to the shape of the chest, it being lower in long chests and higher in broad chests. The shape of chest and position of diaphragm generally exert a combined influence on the shape and position of the heart, so that it is difficult to distinguish their efforts separately. Dr. G. W. Holmes recently showed me with the fluoroscope a patient whose heart appeared normal when lying down, but when standing the heart became pear-shaped through ptosis.

The variations of position of the heart between full inspiration and full expiration are important. With expiration the apex is carried upward by the diaphragm and at the same time the right border moves outward a little so that there is a considerable increase in "ML" and a slight increase in "MR." With full inspiration the apex rotates downward and inward and the right border descends causing little change in "MR" but a marked decrease of "ML." During normal breathing the change of position of the heart is slight and the diaphragm moves about equally up and down. When there is marked visceral ptosis, however, the diaphragm remains nearly as low as in full inspiration. On the other hand it ascends much with full expiration, and displaces the heart correspondingly in this phase of respiration.

The relations of the chest-wall, diaphragm, and heart in elderly persons are complex. There is usually more or less visceral ptosis combined with descent of the diaphragm, but there is also sinking of the chest-wall so that the apex generally remains at the level of the fifth interspace. The descent of the diaphragm is more than offset by stretching of the supporting structures at the base of the heart, so that the

right side descends, and instead of a long heart we find a broad heart, the result of rotation. It was mentioned above that the increase of blood-pressure, and arterial changes of old age tend to cause enlargement of the left ventricle, which may be considered physiological when slight, and which tends further to increase "ML."

Three normal types of heart-shape are commonly recognized: (1) the oblique; (2) the relatively perpendicular, and (3) the relatively horizontal. In the first type the heart is ovoid, in the second it is longer and narrower, and in the third it approaches the shape of a boot with heel to right and toe to left. Besides these there is a type associated with visceral ptosis, narrow chest, and low diaphragm. Its location is almost central, and it has been called by the Germans the "drop-shaped heart." It might better be described, I think, as pear-shaped.

The hearts of youths and girls are apt to be relatively oblique, and those of old persons relatively horizontal, or boot-shaped.

Although the heart in young girls is long and like that of young men in relation to the median line, that of grown women is broader, the apex is higher, and a larger proportion of the heart lies to the left of the median line. Dietlen² showed this difference and attributed it to the use of corsets, with resulting higher position of the diaphragm.

Dietlen's article² on the position of the normal heart is classical and should be read by those who want detailed information. In a subsequent article he presents data on the influence of posture on blood-pressure and on heart-size.⁴ Albers-Schönberg¹² and Groedel⁹ review Dietlen's work and discuss that of others bearing on the shape, size, and position of the normal heart.

Among the foregoing facts the following require emphasis. First: the normal heart varies in shape and position. Second: the shape and position in the individual case are probably more dependent on the position of the diaphragm than on any other single factor. Third: the shape of the chest and position of the diaphragm require consideration in the individual case when there is a question about the existence of slight abnormality in size or shape of the heart.

For instance, a broad heart with a low diaphragm is probably enlarged if its measurements exceed the average for normal hearts, but when the diaphragm is unusually high, the transverse diameter of the normal heart may perhaps exceed the maximal tabulated normal figure, as a result of displacement.

When using measurements to determine the presence or absence of cardiac enlargement the weight of the patient, his age, and the position of the diaphragm at the time of examination require careful consideration. Increase of "MR" or of "ML" points to enlargement to right or left, but when one is increased and the

other decreased, "T" remaining normal, we may have to deal with displacement rather than enlargement. In such cases "L" is valuable as a check if it can be measured accurately.

There are other measurements which require brief mention. The breadth of the heart at right angles to the length, and its relation to length were advocated as standards by Otten,¹⁴ and the surface area (measured by laying the orthodiagram over a sheet of paper ruled in square centimetres and counting the squares) by several observers who recognized the insufficiency of other methods. Groedel⁹ objects to both on the ground that the position of the upper border near the base and of much of the lower border is often doubtful even when the orthodiagraph is used. Teleoroentgenography would be still less satisfactory in such cases. Consequently, estimates of breadth or of surface area are of uncertain value.

Giegel¹³ proposed a method of comparing surface area with body weight by means of what he called the "reduced heart index." This he obtained by a mathematical formula and compared with a standard area per kilogram of body weight. He admitted that the method was open to objection but thought it the best available. His method seems of doubtful value.

When one considers the many factors influencing heart-size, and the inadequacy of existing tables it seems best for the present to compare heart-measurements with average normal figures for the sexes, and whenever the measurements differ much from the averages, to compare them with maximal or minimal standards, to note the position of the diaphragm, to observe the state of nutrition, and to consider the age of the patient if below twenty or above forty before reaching a conclusion. A table of normal standards from Dietlen, Groedel, and Claytor and Merrill is appended (Fig. 9).

Claytor and Merrill's figures for men show

FIG. 9.

STANDARDS OF NORMAL HEART-SIZE IN CENTIMETRES.

Men—Standing.					
Author; Age; No. of Cases.	Mr.	ML.	T.	L.	
Claytor and Merrill;	Min. 3.0(3.2)	7.0	10.7	11.8	
42 cases	Av. 4.0	8.1	12.1	13.7	
	Max. 4.8	11.0(9.7)	14.0(13.8)	15.8	
Men—Seated.					
Groedel	Min. 3.5	7.2	11.2	12.0	
	Av. 4.6	8.4	13.	14.	
	Max. 5.6	10.2	14.6	15.3	
Men—Horizontal.					
Dietlen; 156 cases; age 20 or more	Min. 3.1	7.4	11.0	12.1	
	Av. 4.3	8.9	13.2	14.2	
	Max. 5.9	11.	15.3	15.9	
Women—Standing.					
Claytor and Merrill;	Min. 2.3	6.4	9.6	10.5	
54 cases	Av. 3.4	7.8	11.1	12.5	
	Max. 4.8	9.3	12.8	14.2	
Women—Seated.					
Groedel	Min. 3.0	6.2	10.1	11.0	
	Av. 4.6	8.4	11.9	12.9	
	Max. 5.0	9.8	14.3	14.8	

Women—Horizontal.					
Dietlen; 58 cases; age 17 or more	Min. 2.4	6.8	10.3	11.7	
	Av. 3.6	8.5	12.1	13.2	
	Max. 5.2	10.3	13.7	15.0	
Youths—Seated.					
Groedel	Min. 3.2	7.0	10.5	11.2	
	Av. 4.1	7.8	11.9	12.7	
	Max. 5.2	8.5	13.5	14.3	
Youths—Horizontal.					
Dietlen;	Min. 3.0	6.5	10.4	11.4	
31 cases;	Av. 3.9	8.0	11.9	13.6	
ages 15-19 years.	Max. 5.1	9.3	13.8	15.2	
Girls—Seated.					
Groedel	Min. 2.5	6.5	9.0	10.5	
	Av. 3.7	7.2	10.9	12.1	
	Max. 5.2	8.7	12.7	14.0	
Girls—Horizontal.					
Dietlen;	Min. 2.8	6.5	10.3	11.9	
17 cases;	Av. 3.5	7.8	11.3	12.8	
ages 15-17 years.	Max. 4.0	8.8	12.5	14.0	

variations of 4.0 centimetres within the normal for "ML;" Groedel found differences of 3.0 centimetres and Dietlen for "MR" are 1.8 cm., 2.1 cm., and 2.8 cm.; those for "T" are 3.3 cm., 3.2 cm., and 3.3 cm.; and those for "L" are 4.0 cm., 3.3 cm., and 3.8 cm.

Therefore, it appears that a heart, originally small, might become pathologically enlarged by 3 cm. or even more before this enlargement could be detected by measurements alone; but, in such a case, if nutrition, position of diaphragm, and age, when necessary, were considered, it might be possible to discover enlargements of not more than two centimetres. In ordinary cases enlargements of two centimetres in transverse diameter should be demonstrable in this way.

Examination of the tables (Fig. 9) shows that the variations of "MR" and of "ML" are greater than those of "T." This can easily be explained on the ground that the normal position of the heart is not constant but variable, and that sometimes a greater proportion lies to the right or to the left. We know that this is the case when the hearts of men are compared with those of women who wear corsets, and it can scarcely be doubted that other things which influence the position of the diaphragm may influence the location of the heart similarly. We know also that "ML" is considerably diminished at full respiration, and increased at full expiration, and that "MR" is less affected by the phases of respiration than is "ML." "ML" is relatively much smaller in the pear-shaped heart than in other types. Dietlen² prepared tables of the varying average relations of "MR" to "ML" for men, women, and young persons. The average relation of "MR" to "ML" in men he found to be 1.0 to 2.1 and the average for women 1.0 to 2.4, but in a group of women between the ages of twenty and twenty-nine, at which age displacement is most frequent, the relations were 1.0 to 2.6.

These facts assume importance when it is necessary to distinguish slight enlargement

from displacement; for instance, in any case in which the figures for "MR" or for "ML" were disproportionately large, and yet "T" was within normal limits. If the disproportion in such a case could not readily be explained by the position of the diaphragm, or attributed to a normal type of heart-shape, there might be enlargement even though "T" were within normal limits.

Before passing from measurement of x-ray material to other means of detecting abnormality in the heart, let us consider the basis of the statistics of Groedel and of Dietlen.

Dietlen's² material was selected with the greatest care. He excluded all persons having cardiac lesions, severe, or chronic pulmonary diseases, acute infections, nephritis, arteriosclerosis, old syphilis, anemia, cachexia, marked scoliosis or kyphosis, and hard drinkers. Nearly all who complained of cardiac symptoms were excluded, even when clinical signs of disease were not found, and also those in whom the fluoroscope showed aneurism, marked sclerosis of the aorta, or an abnormal position of the heart; and, finally, the rate, rhythm and quality of the pulse were noted. In doubtful cases the blood-pressure was taken. The patients were all ambulatory persons suffering from mild gastric or nervous diseases, muscular rheumatism, gonorrhoea, fresh lues, skin diseases, or slight injuries, and a large number of soldiers were included in the series. The patients of Groedel and of Claytor and Merrill doubtless, were selected with equal care.

It seems pretty certain, therefore, that very few patients with pathologically enlarged hearts were included among the tabulated cases, and yet, I think it possible that some such may have been included, and that, consequently, the maximum figures may be a little too high.

X-ray plates and orthodiagrams may be of great value to show the outline of the heart. The value of such outlines for early diagnosis has been urged by Ottlen,¹⁴ Wessler,¹⁶ Claytor and Merrill,¹¹ and others. The subject deserves much more consideration than it has as yet received. It seems likely that the cardiac outline will often show abnormalities before they can be demonstrated by measurement, and that these changes may be of great value in discovering slight hypertrophies of the right or left ventricle at a stage when there is little or no dilatation and, therefore, little enlargement.

Cardiac enlargement is due mainly to dilatation of the cavities of the heart, and appreciable dilatation is often preceded by hypertrophy with little or no dilatation. We all know how difficult it may be to detect cardiac enlargement in early chronic nephritis and this is because hypertrophy, as such, adds little to the size of the heart. The ventricle may be doubled or trebled in thickness, but, if the cavity be not enlarged, the increase of heart-size is small. In cases of this sort a rounded apex and curved

left side suggests hypertrophy. Wessler,¹⁶ found this sign valuable as an index of the presence of nephritis in children at a stage when the elevation of blood-pressure was slight, and when there was doubt as to the significance of albuminuria.

Finally, fluoroscopic examination of the heart requires consideration. Its advantage lies mainly in the fact that it shows the heart in action, and it is probable that it will be more valued in the future than it has been in the past. Not only can the movements of the heart as a whole be studied in this way, but the pulsation of the different parts can be observed. The method affords also a general view of the heart and surrounding structures, and may suffice in some cases to give the desired information without plates or tracings.

SUMMARY.

Before finishing I want to emphasize the importance of skillful physical examination and careful history as a means of discovering abnormality in the circulatory system and slight signs of enlargement of the heart.

When findings are inconclusive, an examination with the fluoroscope may quickly clear up the diagnosis. In other cases an orthodiagram or a teleroentgenogram may provide important information by showing slight abnormality in the outline or measurements of the heart. Even with good technic none of these methods are faultless, and normal heart-size is variable. Therefore, enlargement should be judged, as Groedel⁹ said, not by millimetres, but by centimetres.

By using heart-measurements as described above, it should be possible to detect enlargements of two centimetres in transverse diameter of the heart in most cases, but enlargements of three centimetres may occur without exceeding the maximum figures and in such cases abnormality may be difficult to demonstrate.

Abnormal shape may give the earliest evidence by hypertrophy.

The relative merits of orthodiagraphy and of teleroentgenography, the technic, and the sources of error have been discussed by Albers-Schönberg,¹² Groedel,⁹ Dietlen⁸ and others. Neither method is satisfactory without proper equipment, nor in the hands of one unfamiliar with its difficulties and possible sources of error.

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Medical Progress.

RECENT PROGRESS IN PSYCHIATRY.

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PART I.

THE CEREBRO-SPINAL FLUID AND LUMBAR PUNCTURE IN DELIRIUM TREMENS.

Steinbach¹ makes it clear that lumbar puncture is of real value either in cutting short attacks of delirium tremens, or in moderating the severity of the symptoms during the attack. In acute alcoholic poisoning, Schottmüller and Schaum found an increase in pressure in the spinal fluid and detected the presence of alcohol. These findings Steinbach confirms and regards the hypertension as an important factor in the etiology of the delirium since it disappears with the subsidence of the attack. The presence of alcohol in the spinal fluid was found to be dependent on the amount of liquor consumed, just before or during the first few days of the attack, and might otherwise be absent. The albumin content was slightly increased in 3 of the 18 cases on which the article is based. No increase in cells nor Wassermann reaction was found in non-luetic cases.

In all but one of the cases puncture was followed by quick subsidence of the motor unrest and deep sleep without hypnotics. In a number of cases, the patient was lucid on awakening, but in others orientation remained clouded for a short time. In two cases the delirium recurred and a second puncture was required. Serious physical complications do not contraindicate puncture. The increased pressure is attributed to excessive secretion by irritated meninges and defective resorption of the spinal fluid. He does not believe that the alcohol content of the spinal fluid is directly responsible for the delirium. He considers that the irritated meninges and the thickening and connective tissue overgrowth of the pia in chronic alcoholics are the results of the development of "secondary poison" in the body from faulty metabolism.

The good effect of lumbar puncture, therefore, is due not solely to reduction of the pressure, but also to the diminution of the irritant "secondary poison" and the reestablishment of normal equilibrium.

The rational plan of treatment in delirium tremens would, therefore, appear to be lumbar puncture and withdrawal of as much spinal fluid as possible, followed by introduction of a sufficient amount of physiological salt solution to bring the pressure up to normal level.

ALCOHOLIC HALLUCINOSES.

In an exhaustive study of this subject, von Schneider² reaches the following conclusions:

1. Alcohol as an hereditary and etiological factor in the production of insanity has been overrated, incidence being confused with cause.

2. Alcoholic hallucinosis are separate and distinct from the toxic Korsakow and delirium tremens, and show no mental or physical signs of toxic psychoses.

3. The patients who develop hallucinosis are opposed to the homosexual in physical traits, mental characteristics, civil condition, occupation and general reaction to sexual subjects.

4. The alcoholic hallucinosis can not be classed with those of dementia precox because the make-up, the age of onset, the etiology, the suddenness of the onset, the short duration, the complete recovery with unusually good insight and interest and confidence in the future, and the fact that persons developing dementia precox are not addicted to alcohol are directly opposed to this classification.

5. That the alcoholic hallucinosis are purely functional and allied to the manic-depressive insanity and to the recoverable non-alcoholic episodes, hallucinatory and otherwise, in the constitutionally inferior—is indicated by facts gathered from the study of psychiatry of races, of make-up, etiology and outcome. Moreover, the manic-depressive individual is notably given to alcoholic excesses, and manic-depressive attacks and hallucinosis are produced in the same person, and in different persons by exactly the same factors, including alcohol.

6. Alcoholic hallucinosis is a misleading title for the psychosis, because definite precipitating factors other than alcohol are present and necessary in its production and are often reproduced in the psychosis, which shows their importance; because alcohol is not the only factor nor the most important factor nor even a necessary factor in its production, as shown by numerous hallucinosis identical in course and outcome, where alcohol and other toxic factors can be excluded; because debauches both before and after attacks, when the mental precipitating factor is absent, cause no difficulty; because other psychoses, in the same individuals, in which alcohol plays the same part, are not called alcoholic.

INTOXICATION IMPULSE.

Experience during the last four years has forced on Lambert³ the belief that the majority of periodic drinkers, who are endeavoring hopelessly to cease their periodic sprees, are really cases of chronic tobacco poisoning. This is seen more frequently among the incessant cigarette smokers than among those who usually smoke a pipe or cigars. It is seen most commonly among those who always inhale their tobacco smoke. Drugs are absorbed by the tracheal mucous membrane as quickly as by subcutaneous injections. The effect of the pyridin and collidin, and other substances contained in tobacco smoke, is quickly felt by those who inhale. The ease with which

cigarettes can be smoked, the universality of the habit, and the accepted permission that a cigarette can be smoked often in cases in which a pipe or a cigar cannot, add to the frequency of the cigarette indulgence. Tobacco is first used to soothe the nerves, and is taken for its soothing effect. In the early stages it slightly quickens the circulation and thus increases cerebral action. It, therefore, helps in mental rapidity in the early stages of moderate indulgence. Soon it is the accepted panacea for any worry or disturbance of the equilibrium of daily life. Then it is soon necessary to have a certain number of cigarettes that a certain amount of the narcotic may be absorbed to smooth out the daily existence. In this stage of tobacco poisoning the lotos eating contentment and mental inertia are evident and further over-indulgence brings on a nervousness which, in the beginning, a very little more indulgence in tobacco will allay. Soon, however, the more tobacco that is smoked and the more that is inhaled, the greater is the nervousness. It has then ceased to produce its narcotic effect and is producing its chronic poisoning. The individual, therefore, turns to something that he knows will have a narcotic effect and quiet his over-wrought nerves. This he knows alcohol will do, and in these individuals the first drink of alcohol leaves them not sober and starts in them its narcotic craving which drives them on to the full expression of their spree. As they sober up they cease for a few days both smoking and drinking, but as soon as they are over the spree they begin to smoke again and the vicious cycle is sooner or later completed. Lambert is firmly convinced that this double narcotic poisoning explains the majority of the periodic drinkers of to-day. If these patients are made to cease their smoking, their drinking ceases automatically. It is the expression of an uncontrollable poisoning.

MENTAL CHANGES ACCOMPANYING VISCERAL DISEASES.

France⁴ elaborates the observations of Head, published in *Brain*, 1901, xxiv, Head found two symptoms referable to the nervous system in cases of cardiac decompensation, viz: reflected pain along the distribution of the fifth nerve, and a mental and emotional abnormality, aside from any worry about the disease, characterized by depression, anxiety and fear, often with a sense of impending ill and, further these emotional states occurred either with or without distinct delusions and hallucinations. France confirms this statement and adds that the emotional state arising from mechanical difficulty resembles closely that arising from a psychosis, and the true cause of the emotional state may remain unexplained, or may be attributed to hallucinations or delusions. He believes that persistent cardiac irregularity will produce in almost every case either slight and transitory emotional disorders or a distinct and permanent psy-

chosis. He also states that the first mental symptoms of cardiac diseases occur during hypnagogic or sleeping states, and that there is much to substantiate the old view that night terrors and nightmares are often caused by cardiac arrhythmia. The consideration of such states is urged on psycho-analysts.

The study of the nervous symptoms will often warn the physician of impending cardiac disturbance before physical signs of the malady can be detected. The possibility of the occurrence of pain during the somnolent state from cardiac arrhythmia from cardiac and myocardial changes preceding the onset of angina pectoris is thought worthy of further study.

Neuralgia of the trigeminus occurs with sufficient frequency to be of diagnostic and prognostic value to the physician. The symptom may develop in any case of heart strain and may be the first and only symptom of its serious increase. In chronic cardiac affections, neuralgic pains should be regarded always as indicative of the beginning of a period of disturbed compensation.

It is important to remember that many cases of trigeminal neuralgia, or of neurasthenia with anxiety, fear and depression, especially in patients during the fifth decade of life, may be caused by cardiac disorder not sufficiently developed to be discoverable from physical signs. The writer thinks that the limitation of motor activity in cases of cardiac disease by pain and depression may be biologic reaction for the protection of the organism.

PELVIC DISEASES AND MENTAL DISORDERS.

Out of 617 admissions, Perkins⁵ analyzes 478 cases of mental disease of whom 310 showed pelvic disease, and 119 complained of it. She finds that:

1. Pelvic disease, if causally connected with psychoses, can be regarded only as a factor entering into the causal constellation.
2. There is evidence to show that in manic-depressive insanity, pelvic disease is found more often than in dementia precox.
3. Gynecological treatment or operation for the relief of pelvic disorders in our cases have given satisfactory results in benefiting the mental condition in about half of the cases of the manic-depressive group.
4. No benefit to the mental condition has been observed after operations in cases of dementia precox.
5. In epilepsy, in a very limited material of three cases, we have seen one very striking and immediate improvement in the mental state, as well as in the frequency of convulsions. In another case the result was less immediate but also quite satisfactory.
6. Gynecological operations may be one of the precipitating causes of psychoses. The severity of the operation bears no constant relation to the psychosis, and it is possible that

the operation may sometimes act merely as a mental precipitating cause.

7. As to the question of operation in nervous women, not only the physical but also the mental condition should be more thoroughly considered than is often done, and if possible, an adjustment should be brought about before the operation is performed.

8. Sometimes the desire to be operated upon is a symptom of a mental condition.

9. Among twenty-four cases of insane imbeciles studied, fifteen were known to be infected with syphilis or gonorrhea or both. Nineteen had been sexually irregular. Nine had had illegitimate children (one, 3; one, 5). Two, who were married, had had five children.

SENILE PSYCHOSES.

Bleuler⁶ gives an outline sketch of the various senile psychoses as the last fifteen years have classified them by the organic findings. The association of ideas suffers particularly in the organic forms; in progressive paralysis or actual senile degeneration, the drawbacks of business undertakings are not taken into account, and the man is liable to do extremely foolish things as he sees only the chances of success. On the other hand, the man with temporary melancholia or morbid worry, sees only the chances for failure. With this defect in association of ideas, a man is liable to jump off a bridge after his hat, if it was blown into the water, or jump off a high porch after his cigar if he happens to drop it. This defect in association, and not a perverted moral sense, is the probable explanation of the sexual crimes of the senile. They see in a little girl merely the female, and if it is possible to make clear to them the extent of their crime, they feel normal horror and remorse if they had formerly been men of character.

The instability of the emotions causes the senile to be exceptionally swayed by suggestion. One who knows how to manage suggestion can do as he will with the senile, while under other circumstances, they are extremely obstinate and perverse. The way in which the senile forget recent events and recall those farther back sometimes permits a date of demarcation, showing exactly when the mental trouble began. With organic disease the sleep is usually disturbed; such persons may be able to sleep in the daytime while they are restless and excited at night.

As we do not know the causes, we can not do much in prophylaxis or treatment of senile psychoses. It is wise, however, for the patient to avoid alcohol and tobacco, as there seems to be a connection between tobacco and arteriosclerosis. When the psychosis has developed, the physician should see to it that the patient does not lose his property by foolish business ventures, etc. A carefully written out report at the time of the findings in the case may prove of valuable assistance in combating an unjust will. On the other hand, the physician's testimony after an attack of apoplexy may prove valuable evi-

dence as to the unimpaired mind when the layman thinks that the aphasia, etc., testify to mental confusion.

Physical and psychic treatment of arteriosclerosis psychoses may be of great benefit, especially in the early stages. Measures that make much demand on the patient should be avoided and the patient should be guarded against mental and physical effort beyond what he can stand. Complete repose is inadvisable; we must cautiously ascertain the limits in each case. Tonics for the heart may be useful, supplemented by opiates if there is much dread. Potassium iodid, 5 parts, with potassium bromid, 20 parts, is often of decided benefit. Large intake of fluids, especially alcoholic, should be avoided, but the main point is to influence the patient's mind, comforting and tranquilizing him; the symptoms grow milder and rarer as the patient is brought to pay less attention to them. It is a great blessing if he can work and thus be diverted. Work, therefore, should never be forbidden, but the right kind and amount of work should be found for each case. This may lead to far-reaching improvement lasting for years even in apparently quite severe cases.

MENTAL AND NERVOUS DISORDERS ASSOCIATED WITH PELLAGRA.

Singer⁷ says that mental disturbance occurs in about 40% of all cases of pellagra. Such disturbances are more frequent with repeated attacks. Children are practically exempt. They are most common in men between 21 and 40, and in women between 41 to 60. About 95% of the mental disorders are the direct result of the pellagrous intoxication, and although the mortality in such cases is much higher than in cases without such disorders, yet the mental disturbance will fully recover if the patient survives. They correspond to similar disturbances in other somatic diseases, and in such case, are often described as not "insanity." The remaining 5% are examples of mental disorder primarily dependent on the individual's make-up, or else are merely concomitant. Faulty nervous organization, including inadequate mental adaptability, seems to be associated with a predisposition to pellagra. This seems to afford the most satisfactory, even if only partial, explanation of the extraordinary frequency of pellagra arising among the insane, the increased frequency of functional psychoses and psychoneuroses, and of nervous disease of the congenital anomaly type among pellagrins as compared with more normal individuals. Chronic "insanity" due strictly to pellagrous intoxication, if it occurs, is rare. Chronic nervous disease as the result of pellagra, if it occurs, is exceptional.

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Harvard Medical School.

CANCER.*

DR. E. REYNOLDS: By the term "cancer" is meant here malignant disease of either histological type; we shall use carcinoma and sarcoma in those instances where it seems best to be more specific.

Statistics in regard to the prevalence of cancer show that of all diseases of adult life it has the greatest mortality and is second to tuberculosis in mortality of general diseases (*i.e.* adult) and to infantile diseases. Seventy-five thousand to eighty-five thousand die of cancer every year in the United States. Of those who reach the age of 40, one out of every eleven dies of cancer,—one woman in eight, one man in fourteen.

Preventive treatment would do away with by far the greatest amount of cancer mortality, and this enormous improvement can be made if the laity know what they should know, and if the medical profession become proportionately well informed. One of the chief agents in spreading this requisite knowledge is the American Society for the Control of Cancer, which, through affiliations with research and other institutions connected with the problem of cancer control, acts as a clearing-house and dispensary for the most valuable recent information regarding cancer. Through its executive committee, which is composed of some of the most reliable and intelligent surgeons and pathologists dealing with cancer, this society has also done much to crystallize the present applicable knowledge in regard to the nature and treatment of the disease in question. Though we know nothing worth talking about in regard to the exact causes in the origin and spread of the disease, our knowledge of the treatment is pretty thoroughly good. The essential principle in the modern view of cancer is that no sharp division can be made between benign and malignant growth. Also, in distinct contrast to previous teaching, we teach the diagnosis of neoplasm nowadays in (a) the precancerous or benign stage, when operation affords nearly 100% immunity; (b) in the incipiently malignant stage, where operation gives a fair chance against the occurrence of generalized cancer; and (c) in the stage of established malignancy, where but a poor chance is given by operative treatment.

Like most conflagrations, cancer begins as a localized process, controllable but uncontrolled, which, given time, increases locally until so large that metastases break off like brands, to accomplish general ruin.

DR. R. B. GREENOUGH: The cause of cancer is unknown. The influence of heredity was for a long time thought to be of importance. Later its influence was taught to have been overestimated, and now again it has come under consideration in view of the fact that mice have been proven to show hereditary susceptibility to the spontaneous occurrence of cancer.

We have various theories which fit certain special types of cancer very satisfactorily, *c.f.* (a) Cohnheim's theory of embryonic rests, which explains adequately the adrenal tumors of the kidney and certain types of neuroblastomas. (b) The theory of chronic irritation or repeated insult, of which x-ray cancer is the commonest example. The Kangri cancer of Kashmir,—epidermoid cancer of the ab-

dominal wall found in a country where the carrying of hot stoves against the abdomen is a common custom,—is another example of this class.

It may be that under the influence of repeated chronic irritation, cells can revert to the embryonal stage, as, for example, the cells of the bone marrow do after a severe hemorrhage. This explanation, however, gives little help in explaining either the local cancer of the breast or the more generalized systemic diseases, like leukemia and the lymphomata, which are closely related to tumors if not actually recognized as such.

The two important factors in the course and prognosis of a given tumor are: (a) type of the malignant growth; (b) situation and direction of extension.

The problems of cancer as it occurs in general practice are, first, those of diagnosis, and, second, those of treatment. The general practitioner hesitates to make an early diagnosis on very slight evidence lest he be accused of being an alarmist, and, therefore, often waits long and patiently for the "typical picture" before he makes his diagnosis and brings the patient to operation. The "typical case" is the advanced case. Physicians must remember that if they wait for more typical cancer symptoms they are waiting for a proportionately more incurable condition. The handling of the early, doubtful cases, however, is a difficult and delicate problem. Excision of a doubtful tumor of the breast, with closure of the wound, while waiting for a pathological report, is practically certain, if the disease proves to be carcinoma, to deprive the patient of her chance for a cure by radical operation. Incision into the tumor at the time of operation, for diagnostic purposes, is also to be avoided if possible, and the use of the cautery in such cases is much to be preferred. As a general rule, the excision of a doubtful tumor by a wide margin, with the use of the cautery in the more suspicious cases, and especially in such situations as the breast and other organs not directly on the surface, will be found to be the safest plan.

Malignant tumors of different organs have each their own methods of extension. In general, carcinoma extends through the lymphatics, and sarcoma by the blood vessels. Adrenal tumors have a special predilection for cerebral and bone metastases, while carcinomata of the breast and of the prostate appear to have a special ability to metastasize in bone.

DR. REYNOLDS: Cancer of the Uterus. There are two distinct types, differing microscopically, in natural history, in method of treatment, and in prognosis.

(a) Cancer of the cervix is a squamous cell carcinoma which appears first as an ulcerative or sometimes a proliferative process following chronic inflammatory erosion. It has a long precancerous stage of surface ulceration, but a rapid course once it becomes true cancer. The preventive treatment is an early "minor" radical operation,—amputation of the cervix well above the diseased area, with a pathologist in attendance at the operation to examine the excised part for signs of an already established malignancy. The extension in the cervical cancers is by the lymphatics, and is rapid. The symptomatic indication for cervical amputation is bloody, irritating leucorrhea persisting in a woman thirty-five to fifty years old.

(b) Cancer of the fundus begins as a glandular hypertrophy at a time when there should be

* Abstract of Joint Lecture on Feb. 25, 1916.

atrophy. Proceeding deeper and deeper, the glandular structures take on the character of adenomata, and eventually of carcinoma. In contrast to the cervical tumor, cancer of the fundus remains operable late in the process of the disease, and does not travel by the lymphatics but by extension, often along the ovarian artery. The most serious feature is the budding of bits of malignant tissue into the peritoneal cavity, separation, and thus metastases, to any portion of the peritoneal surface. The symptoms are slight irregular increase in the menstrual flow, especially significant if between catamenia, eventually becoming slightly pinkish serous exudate. This condition in a woman in the late forties is the nearest to a pathognomonic sign one could ask for. The treatment is curettage, with pathologist present to determine the nature of the curettings, and full preparations made to proceed to hysterectomy then and there if need be. If a pathologist cannot be obtained, it is a question for the surgeon's conscience to decide,—whether the patient be referred to a place where expert opinion is obtainable, or be allowed to be curetted and wait for radical operation.

DR. GREENOUGH: Cancer of the Breast. Statistics show that even at present, when the various operations for breast cancer and their indications have become standardized and well known, the percentage of cures of cancer of the breast is low; 30-40% of the cases have a 3-5 year freedom from recrudescence, but recrudescence after 9 to 12 years occasionally happens. About 30% of the cases which come to a general hospital are beyond the possibility of cure. Surgeons who operate on less favorable cases have less encouraging results to report than the men who accept nothing but the most suitable cases.

The diagnosis of cancer of the breast is usually made on anatomical findings,—a lump, often hard, in the mammary tissue, often accompanied with axillary glandular involvement, in a woman over twenty-five to thirty.

The standard radical operation involves the removal of the entire breast with its skin, the pectorales, major and minor, the deep fascia of the chest wall, the contents of the axilla, excepting the larger veins, arteries and nerve trunks, and as much of the lymphoid tissue in the neck as the individual case indicates.

The best judgment in operative procedure is to do a radical removal, where the diagnosis of cancer is reasonably sure, even if it is not positive. When the diagnosis is doubtful but in favor of non-malignancy, it is well to excise with cautery, rather than with knife. This last warning is based on the experience at the Massachusetts General Hospital, that in cases where a supposedly benign tumor was excised with the knife, and proved malignant on subsequent pathological examination, the results were uniformly fatal.

The differential diagnosis of cancer of the breast is of much importance because the indications for operations are so inclusive as to commit us to many unnecessary operations. The most common condition to be differentiated from cancer is cystic disease, which differs in not being sharply localized, in not being adherent to the skin, in producing no axillary involvement, and in being painful during catamenial periods in some patients. Ten to fifteen per cent. of cystic disease develops into cancer, so that removal is indicated in case of there being any accompanying induration. It is exceedingly hard

to differentiate fibromata late in life, as they resemble cancer very closely, often with loss of skin mobility over them. It is also hard and probably less important to differentiate chronic abscess from cancer of the breast.

The types of cancer of the breast are the medullary and scirrhus, easily recognized microscopically, but clinically less important to differentiate; adenocarcinoma, grows outward, and has considerable bulk, but is slow to generalize. Colloid carcinoma produces degeneration of the cells and stroma, with low vitality and slow growth of cells. The prognosis in adeno-carcinoma and colloid cases is much better than in the medullary and scirrhus types.

DR. REYNOLDS: Cancer of the Ovary. This condition is rarely primary. A few of the cystomata in the later stages undergo cancerous degeneration of the living membrane, and the deeper layers are invaded by direct extension. Dermoids may become malignant if neglected. Solid tumors arising from the corpus luteum are likely to be malignant in the end, but are comparatively rare.

Cancer of the Kidney and Bladder. Clinically you cannot speak of these apart from each other, but their symptoms,—infrequency and hematuria,—being eminently characteristic of stone, they must be differentiated from stone by careful direct observation. Cancer of the bladder usually begins as papilloma, which may often be seen by cystoscope. The treatment is immediate excision of the papilloma, together with the surrounding part of the bladder. If the cancer is extensive the whole bladder can be removed and the ureters led into the rectum, external skin surface, or vagina. These cases, however, usually die in one or two years from infection of the kidney.

If the symptoms continue, the kidney should be x-rayed, and tumor may be found there as well.

In this question of cancer, the physician is on the horns of a dilemma; he must choose a course between that of an alarmist and that of a timid loser.

DR. GREENOUGH: Cancer of the Tongue. This is a squamous epidermoid neoplasm, producing very few vacuole metastases, but rapid in extension to the floor of the mouth, and one of the most resistant of cancers to radical operative treatment. The radical operation requires marked vigor on the part of the patient; the cures are 15-20%. Only one-third of all cases in a ten-year series at the Massachusetts General Hospital were suitable for operation. Cancer elsewhere in the buccal mucous membrane resemble those of the tongue, except that in cases of cancer of the upper jaw the operative risk is smaller. The Whitehead operation consists of cutting the muscles at the base of the tongue, drawing it forward through the mouth and then doing the dissection of the neck as a separate operation. This method is adapted only to the very early cases. Removal through the floor of the mouth smears all the neighboring tissues and is, therefore, to be criticized. Division of the jaw is a very severe operation and removal of the jaw has a 25-30% mortality of itself.

In cancer of the lip the percentage of cures is high, presumably because of the probability of earlier diagnosis and the accessibility of the part. In these cases there is evidence of embolic infection in the lymph glands of the neck, because there is no direct chain of metastases down to the glands. The dissection of the neck glands is done in a separate block; 90-100% are cured when the neck glands are not involved, 40-60% is the proportion of cures

when there is involvement. A V-shaped piece containing the neoplasm is removed from the lip, together with the submental and submaxillary lymph nodes. The deep carotid nodes are removed with the internal jugular vein in cancer of the tongue. The vein is usually left in in cancer of the lip, but is dissected clean of glands.

DR. REYNOLDS: Cancer of the Colon. This is a condition especially liable to be overlooked, and in making the diagnosis the value of a comprehensive series of bismuth plates and the findings from proctoscopy must be borne in mind. Compared with these measures, plus the symptoms, palpation is unimportant, especially if no mass be felt. The suggestive symptoms are gas colic, diarrhea, bloody stools and abdominal pain. The operability of cancer of the colon depends on the location and on the length of the mesentery, growths above the splenic flexure having a specially good prognosis. Though the proctoscope often affords inspection to a remarkably high point, the examiner usually is not able to see the mass, and diagnosis is often made correctly without positive proctoscopic evidence.

DR. GREENOUGH: Cancer of the Stomach. Time prevents our consideration of this condition at all adequately. As in cancer of the colon, the importance of an early diagnosis overwhelms all other points. The 30-33% of successful pylorectomies and gastrectomies of the Rochester Clinic is higher than the averages elsewhere.

DR. REYNOLDS: General Principles of Radical Operation. Do not disturb the malignant tissue. Let the pathologist be the first to incise the pathological tissue. All incisions should be confined to normal tissue; if the dissection must come near the cancer (as in axillary lymph tissue excision) it should be done by blunt dissection, sweeping toward the periphery.

DR. GREENOUGH: The Use of Radium and X-ray. In cancers of the skin or in superficial growths which are persistent and active, some sort of radical treatment is necessary. Radium and x-ray are of value in retarding or destroying certain superficial types of growth, but have not yet justified as much as it was hoped they would accomplish. X-rays are of relatively slight value, but radium is distinctly valuable in the treatment of readily accessible epidermoid cancers. Where the epidermoid has burrowed deep and into the bone, radiation has little effect. The scars left by radiation are unusually soft and pliant. In splenic myelogenous leukemia radium applications have had marked effect in reducing the size of the spleen and of the white count (775,000 in March, 25,000 in July), and in controlling the extent of recurrent symptoms. Cancer of the cervix is susceptible to radium, but its metastases are not affected, and in the same way the metastases of breast cancer are not affected, though it is possible to kill superficial local recurrences. A large number of the ulcerative forms of cancer show improvement under radiation; so that we recognize the cases in groups as being:

- (a) Superficial cancer, which radium destroys,
- (b) Ulcerated deeper forms of cancer, which radium improves temporarily.
- (c) Advanced cases, in which radium appears to have no favorable effect.

R. B. GREENOUGH, M.D.,
ALAN GREGG, A.B.

MEDICAL MEETING.

Amphitheatre of the Peter Bent Brigham Hospital on Tuesday Evening, February 29, at 8.15 o'clock.

DR. HENRY A. CHRISTIAN, president, in the chair.

Abstract of paper by DR. EUGENE F. DuBOIS of New York on "The Respiration Calorimeter in Clinical Medicine":

IN these days, when housewives speak in terms of calories and the newspapers deal with vitamins, it may be well for clinicians to examine once more the fundamental principles of nutrition. Patients no longer demand medicines, but they do expect diets, and if they are at all up with magazine literature, they are better informed on the subject than the text-books which most of us studied in the medical schools.

The science of nutrition in disease must be founded upon experiments in calorimetry and the respiratory metabolism. The word metabolism indicates the transformation of matter and refers to the breaking down of foods, to their absorption, and to the building up of body tissues. The term also refers to the oxidation of foodstuffs and of body tissues, with the consequent liberation of warmth and energy.

In the years between 1892 and 1908 there was no work being done on this subject in our American hospitals, although Atwater and his successor Benedict, in Middletown, were making classical experiments on normal men, and Lusk, in New York, was making similar experiments on dogs. During the same period in Germany the respiratory metabolism was being studied in a dozen clinics, and the investigators were hoping that at some time means would be found to apply the apparatus of Atwater and Benedict to the study of disease, since this alone would solve certain problems. About seven years ago, Benedict and Joslin, here in Boston, began to study the respiratory metabolism of diabetes, and four years ago investigation of the gaseous exchanges of typhoid patients was begun in Bellevue Hospital. Shortly afterward the directors of the Russell Sage Institute of Pathology decided to turn over their funds to Prof. Graham Lusk for a period of five years in order that a calorimeter might be built and maintained in Bellevue.

The calorimeter itself consists of a copper box about the size of the lower berth of a sleeping car. It contains a comfortable bed and is provided with two windows, a shelf, a telephone, a fan, a light, and a Bowles stethoscope for counting the pulse. The ordinary experiment takes about as long as a trip from New York to New London, and there is an agreeable absence of cinders. Patients, as a rule, doze from time to time, or else try to work out some scheme by which they can amuse themselves without moving. After three or four hours they are rather bored by the quiet, and the observations are not prolonged beyond this time. They are allowed to turn over in bed once or twice an hour, but reading and telephoning are discouraged, since these increase the metabolism. The air in the box is fresh and pure, the patient suffers no discomfort, and objections to the procedure are very infrequent. Most of the patients are only too glad of the extra attention, and they insist that the calorimeter has a marked therapeutic value.

The apparatus has two distinct functions: (1) the physical measurement of the heat production of an individual by the method of direct calorimetry; (2) the chemical measurement of the gaseous exchanges and the calculation of the heat by the method of indirect calorimetry. Both depend on the fact that the apparatus is a closed circuit, absolutely shut off from the surrounding atmosphere in such a manner that everything eliminated by the subject is caught and measured.

The main object of all investigators has been to determine the heat production of the patient while at complete rest fourteen hours or more after the last meal. This is the so-called basal metabolism, and is of interest only when compared with the figures obtained on normal individuals. Since it is impossible to measure the metabolism of many of our patients when they are entirely recovered, it is necessary to calculate what the man's metabolism would be were he normal. Here lies the most difficult problem. Controversies have raged more fiercely about the normal controls than about the pathological cases. It has been said that a man is as old as his arteries. It may also be said that a piece of research work is as good as its normal controls.

The normal controls used by investigators up to the last few years often showed a variation of 50% above or below the average. This variation in the normals was largely due to the manner in which the results were expressed. Part of the error is eliminated if we express the result in calories, and still more eliminated if we base our calculations on surface area rather than body weight. Mr. DeLafield DuBois has devised a method of measuring the skin area which has been applied to ten individuals of every conceivable shape. He has found an average plus error of 16% in Meek's formula and an error of 36% in fat subjects. To correct these the so-called "linear formula" has been devised and also a simpler formula based on height and weight. We now feel certain that with men between the ages of twenty and fifty the metabolism of each individual is proportional to his surface area, whether he be short or tall, fat or thin.

As I have said, the basal metabolism is measured fourteen hours or more after the last meal because food stimulates the metabolism. This is due to the so-called specific dynamic action of foods, and is greatest in the case of protein and least in the case of carbohydrate. The phenomena, first discovered by Rubner, have been studied in great detail by Lusk, using the dog calorimeter at the Cornell Medical College. He has found that the specific dynamic action of protein is due to the stimulus of the metabolism products of amino-acids acting upon cell protoplasm, and that, although the preliminary cleavage products of fat and carbohydrate do not appear to be direct stimuli, yet when they are present in excess in the fluid bathing the cells, the heat production is increased.

Metabolism in Disease. The most striking disease from the standpoint of changes in the total metabolism is exophthalmic goiter, and clinicians who pay no attention to the gaseous exchanges neglect the most important phase of this malady. In general it may be said that very severe cases show an increase of 75% or more, severe cases 50% or more, moderately severe and mild cases less than 50%, while a few mild, atypical or operated cases may be within normal limits. In regard to the medical treatment of Graves' disease the calorimeter may be

a therapeutic nihilist, but it is a dietetic enthusiast, and it is also a strong supporter of the belief that mental and physical rest are essential in the treatment of severe cases.

The effect of the Allen fasting in diabetes in the severe case most completely studied was to cause a gradual rise in the quotient as the D:N ratio fell and the glycosuria cleared up. After the fast the curious phenomenon mentioned by Joslin was noted. There was a rise in quotient indicating the combustions of carbohydrate from some unknown source. This may be stored glycogen, excess of sugar in blood and tissues, or perhaps it may be due to the oxidation of acetone bodies. Another effect of the fast was the marked fall in total metabolism.

The total metabolism in typhoid fever shows an increase which is roughly proportioned to the rise in temperature. Patients who are liberally nourished with high calory diet of Coleman and Shaffer do not have a greater heat production than patients on low diets. Peabody, Mery and DuBois have studied sixteen patients with cardiorenal disease. It may be said in general that mild cases of nephritis and compensated cardiac patients are within normal limits, as are a few severe cases of both diseases. An increase in heat production amounting to 30 or 40% is found in most of the very dyspneic patients of the type in which acidosis is often present.

(Lantern slides were shown to illustrate the paper).

Discussion by Drs. F. E. Benedict, W. M. Boothby, F. B. Talbot, J. H. Means of Boston and Dr. L. H. Wilson of Rochester, Minn.

ERNEST G. GREY, M.D.

Book Reviews.

Laboratory Methods. By B. G. R. WILLIAMS, M.D., and E. G. C. WILLIAMS, M.D. Third Edition. St. Louis: C. V. Mosely Co. 1915.

The previous (second) edition of this textbook of laboratory methods was reviewed in the issue of the JOURNAL for October 16, 1913, (Vol. clxix, page 580). It is designed with special reference to the needs of the general practitioner. In this third edition a few new procedures have been added in the text, but the majority have been placed in an appendix. Among the chief of these are the elastic tissue stain, the salting out method for tubercle bacilli, a simple gram stain, an invariable blood stain, a dressing for laboratory tables, and a number of other notes. The book retains its interesting and commendatory introduction by Dr. Victor C. Vaughan, and the forty-three excellent engravings with which it is illustrated. It should retain its useful individuality among the multitude of laboratory manuals now in existence.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE BOSTON CITY HOSPITAL.

THE recently published fifty-first annual report of the trustees of the Boston City Hospital records the activities and progress of that institution and its many branches for the year ended January 31, 1915. Statistics are presented of the Hospital proper, the South Department for Infectious Diseases, the Haymarket Square and East Boston Relief Stations, the Convalescent Home at Dorchester, and the Training School for Nurses. During the period covered by the report there was treated in the hospital wards and the South Department a total of 16,498 patients, with a mortality rate of .096. The number of out-patients treated during the year was 43,891, who made a total of 143,462 visits. The total number of patients admitted to the wards since the opening of the Hospital and the South Department has been 365,050, and the number of out-patients has been 1,003,282.

In November, 1915, an orthopedic shop was opened at the Hospital, and since that time 393

patients have been supplied from it with different kinds of apparatus. During the past year 279 out-patients have been supplied with apparatus, and these patients made a total of 680 visits to the shop.

The South Department has continued its important activities in the control of contagious diseases in this community. The following is an extract from the report of the advisory board of this department:—

“Twenty-six hundred and ninety patients were admitted to the South Department in 1914, which is 287 more than were received the previous year.

“The South Department has been taxed to its fullest capacity. While there has been no real epidemic of scarlet fever, diphtheria or measles, yet the number of scarlet fever cases has far exceeded the average for the past few years.

“Because of the confidence displayed by the public in this department and consequent yearly increase in the number of patients, this department has far outgrown the needs as anticipated twenty years ago upon its inauguration. Because of the number of scarlet fever cases it became necessary to request of the Board of Health the temporary use of the hospital at No. 106 Southampton Street, which was done on March 13, 1914; and later money was transferred from the reserve fund to the hospital fund for maintenance of the same.”

Particular attention should be directed to the work of the surgical department. During the year covered by the report, 6021 surgical cases were treated in the wards of the hospital and 18,188 in the surgical out-patient department, to which a total of 85,658 visits were made. With this should be regarded also the work of the two relief stations, which is essentially surgical. During the thirteen years of its establishment the Haymarket Square Relief Station has treated 456,293 patients, of whom 41,206 were during the year covered by the report. These patients received 42,994 days' treatment at an average cost of 91 cents per day. The East Boston Relief Station, during the six years of its operation has treated 85,450 patients, of whom 12,987 were during the year covered by the report. These patients received 35,416 days' treatment at an average cost of 54 cents per day. Early in the year there was placed in the surgical out-patient department a paid dresser, which has tended to dispose more rapidly of the surgical cases. We are convinced that the work of the surgical department in all its divisions is maintained at a high standard

of efficiency and of regard for the welfare and comfort of patients and that statements previously made to the contrary by prejudiced persons are without foundation in fact.

Particular attention should be called also to the adoption by the Hospital of the new system of loose leaf records based upon the Bellevue Hospital system, but modified to suit the needs of the City Hospital, and established for all its departments. In practice this system has proved to work exceedingly well and its adoption is a credit to the far-sighted policy of the trustees, since it increases greatly the value and accuracy of the hospital records.

The department of vaccine and serum therapy has carried out its work with painstaking assiduity.

"The total number of patients receiving bacterial vaccines was 632; number of visits to this clinic, 3,447; number of vaccine inoculations, 2,833. The total number of patients under antisyphilitic treatment was 327. Number of cases of syphilis of the central nervous system treated by intradural injection of salvarsanized serum or under observation, 81. The total number of visits for this treatment (exclusive of visits for salvarsan injection) was 1905. The number of salvarsan injections was 766; mercury injections, 311; blood taken for Wassermann and Schwartz tests, 788. Total number of recorded cases under observation and treatment, 1040."

During the year a number of changes in the rules have been made. New rules were established for the admission of patients.

"The following new positions in the medical and surgical staff were created: a consultant on contagious diseases, a physician in tropical diseases, two positions as dentist, a temporary assistant to the physician for x-ray service.

"A fourth surgical service and a fourth medical service were established, the third and fourth medical services being made continuous.

"The titles of the physicians connected with the neurological department were changed to conform with the nomenclature in other departments."

There was also established at the Hospital a department of medical social service, whose progress and valuable activities were discussed editorially in the issue of the JOURNAL for February 17.

The report presents further elaborate statistics of the detailed work of its departments. The Training School for Nurses has completed its thirty-sixth year. During the period covered by the report, forty nurses were graduated,

and on January 31, 1915, 238 remained in the Training School. Throughout the Hospital the year was one of increasing activity and of progress, carried forward with credit to all concerned in the work of this leading medical and municipal institution.

THE MEDICAL RECORD, A SEMI-CENTENNIAL.

It is a great pleasure for the JOURNAL to extend its cordial congratulations to its New York contemporary, the *Medical Record*, which, with its issue of March 4, 1916, completes the first half century of its existence. The *Record* has been remarkable and fortunate that during this period it has had but one change of editors, Dr. George F. Shrady, the first editor of the publication, having guided its course from 1866 to 1904. We can wish no better fortune to the *Record* than that its present editor may have as long a service.

With the portrait of Dr. Shrady, which appears in the fiftieth anniversary number of the *Record*, are published also likenesses of some of the distinguished authors whose contributions have appeared in its columns,—Dr. Gordon Buck, Dr. Austin Flint, Senior, Dr. Alfred C. Post, Dr. T. Gaillard Thomas, Dr. W. H. Van Buren and Dr. Elknanah Williams. These names and personalities recall many of the notable events in the progress of medical science during this half century, which is well summarized in an article appearing in this memorial number on "Fifty Years of Medical Progress."

The *Medical Record* is to be congratulated upon the part which it has played in this half century of progress and upon the auspicious prospects with which at this semi-centennial epoch it enters upon its future of continued service to the science and profession of medicine.

THE BOSTON MEDICAL LIBRARY.

IN former years we have, from time to time, called the attention of our readers to the important work done by the Boston Medical Library as an agent in the diffusion of medical knowledge and as a collector of one of the largest groups of medical literature in the

United States. In the issue of the JOURNAL for January 27 we commented editorially on the recently published fortieth annual report of the Library, presenting the statistics of its growth and particularly of its progress during the past year.

The Library has, at present, 484 Fellows and 270 associates, a small membership compared with the number of physicians in Boston and its vicinity. During 1915 the net gain in membership was only 24. The Library, however, is extensively used, much more, it appears, by non-members than by members. During 1915 the Library was visited by members 4160 times and by non-members 7985 times. During the year also, 64 medical society meetings were held in the Library building.

It is obvious that the Boston Medical Library serves an important and valuable function in the medical life of the community, in the development of medical science, and in the furtherance of medical education. Its doors are freely open to medical students and to members of the profession. It should be regarded as the duty and privilege of that profession adequately to support the institution by financial contributions. Any medical graduate of less than five years' standing or any physician not resident in Boston may become an associate member at an annual fee of \$5.00. Physicians living in Boston, who have been in practice more than five years, must become Fellows, at an annual fee of \$10.00. Life membership, at a fee of \$200 is of particular value to the Library, since from these fees an endowment fund will be slowly developed. Any person with a degree in medicine or science is eligible for membership. It is earnestly to be hoped that the profession will realize its responsibility in the maintenance of one of the distinguished and most worthy of Boston medical institutions.

TWO NEW MEDICAL JOURNALS.

It is a pleasure to chronicle the initial appearance of two new American medical journals, the *Journal of Cancer Research* and the *Journal of Immunology*. Both these periodicals are published in Baltimore with English offices at the Cambridge University Press, London.

The *Journal of Cancer Research* is to be edited by Dr. Richard Weil with an editorial committee representing the American Associa-

tion for Cancer Research, whose proceedings are published in the *Journal*. On this committee Dr. Joseph C. Bloodgood is the representative of Johns Hopkins University, Dr. Leo Loeb of Washington University, Dr. Ernest E. Tyzzer of Harvard University, Dr. Weil of Cornell University, Dr. H. Gideon Wells of the University of Chicago, and Dr. William H. Wogdom of Columbia University. The *Journal of Cancer Research* is to be published quarterly, its first issue being dated January, 1916.

The *Journal of Immunology*, a bi-monthly publication, whose first issue is dated February, 1916, is the official organ of the Society for Serology and Hematology and of the American Association of Immunologists. It is to be edited by Dr. Arthur F. Coca, with an international advisory board of nine, and an editorial board of thirty-six members. The advisory board consists of Dr. Simon Flexner, Dr. William H. Park and Dr. Theobald Smith, of New York; Dr. Ludwig Hektoen, of Chicago; Dr. Robert Muir, of Glasgow; Dr. F. Nuttall of Cambridge, England; Dr. V. C. Vaughan of Ann Arbor, Mich.; Dr. William H. Welch, of Baltimore; and Dr. A. E. Wright of London. The Boston members of the Board of Editors are Dr. Milton J. Rosenau and Dr. Richard P. Strong of the Harvard Medical School.

The JOURNAL extends its most cordial and confident good wishes for the prosperity and the success of these two new special publications of medical science.

DEATH OF DR. RODMAN.

DR. WILLIAM L. RODMAN, president of the American Medical Association, died of pneumonia at his home in Philadelphia on Wednesday, March 8, 1916. He was born in Frankfort, Ky., in 1858, and received his medical education at the Jefferson Medical College. In 1899 he was appointed professor of surgery at the Medico-Chirurgical College, Philadelphia, and held this position until his death. He was president of the American Medical College Association in 1902; and in June, 1915, he was installed as president of the American Medical Association at its sixty-sixth annual convention in San Francisco. He was also a member of the American Surgical Association, the Pennsylvania State Medical Association, the Kentucky State Medical Society, the Philadelphia Academy of Surgery, the Philadelphia Pathological Society

and the International Surgical Society. Dr. Rodman had an international reputation as a surgeon and as an authority in the study of cancer. His recent visit to Boston to address the Surgical Section of the Suffolk District Medical Society on the surgery of duodenal ulcer has left a particularly pleasant and vivid remembrance of his personality with the profession of this city. His untimely death is a grave loss, not only to the American Medical Association, but to medical science.

MEDICAL NOTES.

UNION OF TWO MEDICAL JOURNALS.—It is announced that the *American Journal of Gastro-Enterology* has combined with the *Proctologist* as a quarterly journal under the name of *The Proctologist and the Gastro-Enterologist*. The editorial staff will consist of Dr. Rollin H. Barnes, St. Louis, Proctology; Drs. Anthony Bassler, New York, and Lewis Brinton, Philadelphia, Gastroenterology; and Dr. A. L. Benedict, Buffalo, Dietetics.

MEDICAL SOCIETY OF THE MISSOURI VALLEY.—The twenty-eighth semi-annual meeting of the Medical Society of the Missouri Valley will be held on Thursday and Friday of next week, March 23 and 24, at St. Joseph, Mo., under the presidency of Dr. John P. Lord of Omaha, Neb. The scientific program will comprise twenty-five papers and two orations. Invitations have been extended to the presidents of state societies and representatives of the United States Public Health Service. The secretary of the society is Dr. Charles Wood Fassett of Kansas City, Mo.

PREVALENCE OF MENINGITIS, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for Feb. 25 states that during the month of January, 1916, there were reported in Massachusetts 15 cases of cerebrospinal meningitis, 4 of poliomyelitis and 82 of typhoid fever. During the same period there were 10 cases of meningitis in Wisconsin and 9 in Maryland. There were 170 cases of smallpox in Minnesota, 150 in Wisconsin and 99 in Michigan. There were 90 cases of typhoid in Maryland, 88 in Michigan, 84 in Louisiana and 54 in Minnesota.

In the weekly health report for March 3, it is stated that during January, 1916, there were 4300 cases of malaria and 364 of pellagra, 262 of typhoid fever and 214 of smallpox in Mississippi; 10 cases of cerebrospinal meningitis in California; 14 cases of poliomyelitis in Virginia. In Ohio there were 22 cases of smallpox and 210 of typhoid fever. There were 219 cases of smallpox in Kansas and 217 in Iowa.

HEALTH OF NEW YORK CITY LAST WEEK.—According to Registrar Guilfoyle, figures com-

pared at the Department of Health show that during the week just closed 1628 persons died in the city of New York, as compared with 1518 during the corresponding week of 1915, the respective rates being 15.20 and 14.52 per 1000 population. The difference is equivalent to an increase of 72 deaths. By an odd coincidence the number of deaths is exactly the same during the past week as during the previous week. Fewer persons died of contagious diseases last week than during the corresponding week of last year, or during the previous week of this year. The deaths, however, from influenza and the respiratory diseases, were slightly more numerous during the past week than during the week ending Feb. 27, 1915. Four hundred and seven (407) deaths were reported as due to organic heart disease and nephritis, as compared with 356 deaths reported as having been due to the same cause during the corresponding week of last year. Eleven more deaths were reported as due to pulmonary tuberculosis than during the week ending Feb. 27 of last year; this increase is due solely to the larger population of this year. Considered from the viewpoint of age distribution, the deaths of children under one year and under five years of age were fewer than during the corresponding period of last year, while the deaths of the higher age groupings were more numerous. During the first nine weeks of 1916, the death rate was 16.03, as compared with 14.77 for the corresponding period of 1915.

SANITARY CONDITION OF BOTTLED WATERS.—The United States Bureau of Chemistry for several years has been investigating the sanitary conditions in the production and distribution of bottled mineral and table waters, which are offered for sale in interstate commerce and therefore subject to the Food and Drugs Act. It is recognized that the sale of bottled waters is dependent largely upon the belief by the public in the purity of the product. The bureau has recently conferred with a large number of sanitary experts and bacteriologists regarding a desirable standard for judging the sanitary character of bottled waters. As a result of the investigational work and the above-mentioned conferences, the bureau believes that the tolerances established by the Public Health Service of the Treasury Department for waters served on interstate carriers is none too rigid for application to bottled waters sold in interstate commerce or imported from foreign countries. The Treasury Department standards are as follows:

1. The total number of bacteria developing on standard agar plates, incubated 24 hours at 37° C., shall not exceed 100 per cubic centimeter; provided, that the estimate shall be made from not less than two plates, showing such numbers and distribution of colonies as to indicate that the estimate is reliable and accurate.

2. Not more than one out of five 10 c.c. portions of any sample examined shall show (by the

method of the Public Health Service) the presence of organisms of the *Bacillus coli* group.

LIBRARY OF THE PHILADELPHIA COLLEGE OF PHYSICIANS.—In its annual report the Library Committee of the College of Physicians of Philadelphia record the acquisition of a number of rare and interesting volumes. Among them may be mentioned a five-volume Aldine edition of the works of Aristotle dated 1495. It is a superb copy of the first edition of the work of Aristotle, printed in Greek characters. The value of this work is increased by the fact that it was one of the earliest examples of books printed entirely in Greek characters. Dr. Fielding H. Garrison says: "The greatest scientific name after Hippocrates is that of the 'Master of those who knew,' the Asclepiad Aristotle (384-322 B.C.), who gave to medicine the beginnings of zoölogy, comparative anatomy and embryology, and the use of formal logic as an instrument of precision."

There is also a Bevilacqua edition, 1497, of the work of Julius Firmicus Maternus, "*De Nativitatibus*."

This is a first edition with a good example of a xylographic Gothic title, and a woodcut printer's device on the last page. This work is quite rare, and, while not medical as a whole, contains much pertaining to medicine.

A volume dated 1513 by Eucharius Röslein, called "*Der swangern Frauen und Heebamen Rosengarten*," is a first edition of the first work printed on obstetrics. This work is based on a manuscript by Moschion, a writer of the second century. The "*Rosengarten*" was translated into English by Thomas Raynald, under the title "*The Birth of Mankynd*." The binding is an excellent example of early sixteenth century German work. A very rare and beautiful specimen from the first press at Augsburg is a volume by Rodericus Sanctius, Bishop of Zamora, called "*Speculum Vitae Humanae*," dated 1471. This is the earliest dated book in the Library of the College. The Library also reports a complete copy of the *Anatome Topographica* of N. I. Pirogoff, who was the greatest Russian surgeon of his time, and who is remembered today by his operation of amputation of the foot—"Pirogoff's amputation." His Anatomy, a monumental work of great value, in which frozen sections were first used in the process of illustration, seems almost unknown to the present generation.

NEW JERSEY STATE HOSPITAL.—The fortieth annual report of the New Jersey State Hospital, at Morris Plains, N. J., is at hand. During the year there were admitted to this hospital 606 patients, 303 men and 303 women; this is more admissions than in any year since the opening of the institution in 1876. The year closed with a greater increase of patient population than in any preceding year of its existence. The average yearly increase since 1892 has been about

100, while the increase for the past year was 160. The year ended with a population of 2669—1335 men and 1334 women. The per cent. of recoveries is 15. In former years, under more favorable housing conditions, the percentage has been as high as 35.89. The hospital's overcrowded condition has made impossible the proper assignment of sleeping quarters to a large percentage of unimproved patients whose mental condition would undoubtedly have been benefited under proper classification and suitable accommodations. Over 43% of the admissions were foreign born.

HEALTH OF SCHOOL CHILDREN.—The Bureau of Education, Department of the Interior, at Washington, has recently issued a pamphlet, Bulletin 1915, No. 50, called "*Health of School Children*." It is compiled by W. H. Heck, professor of education, University of Virginia, and contains seventy-three articles on subjects relating to the health of children in public schools. The articles have been reprinted from various American medical journals published during the year of July, 1914 to July, 1915. Among them may be mentioned: "A Definite Plan for a System of Health Supervision of School Children in Ohio," by P. Bruce Brockway, M.D.; "Medical Inspection of Open-Air Schools," by John Aikman, M.D.; "County Health Organization in the United States," by Louis I. Dublin, Ph.D.; and "Prevention of Schoolroom Diseases and Dust," by C. Ward Crampton, M.D. Copies of this pamphlet may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 20 cents per copy. A similar compilation, Bulletin, 1915, No. 4, was published of articles printed during the previous year.

EUROPEAN WAR NOTES.

AMERICAN AMBULANCE HOSPITAL.—It is announced by the United States Committee of the American Ambulance Hospital at Neuilly, France, that efforts are being made to secure endowment for individual beds at the hospital. It is estimated that for about \$600 a bed can be supported for one year, the bed bearing a commemorative plate with the names of the donors, and it is planned to have nurses in charge of these beds communicate directly with the donors regarding the work that is being done.

New England contributors will be glad to know that contributions are coming in from Chicago, St. Louis, the South and the West, but the suffering in the war zone is great, and the American Ambulance Hospital depends entirely on America for its support.

Please send contributions to Mrs. E. D. Bran-degee, 82 Devonshire Street, Room 604, who will immediately forward to J. P. Morgan & Co., to be cabled to Paris. Monthly contributions are much appreciated by the committee.

AMERICAN RED CROSS IN CORFU.—Report from Athens by way of Paris on March 6, states that Dr. Edward W. Ryan and Dr. Ralph Bates, of the American Red Cross Commission to Serbia, left Athens on March 2 with 240 tons of medical and other supplies for the relief of Serbians on the Greek island of Corfu.

TREATMENT OF TUBERCULOUS FRENCH SOLDIERS.—Report from Paris on March 7 states that the Paris City Council has voted a sum equivalent to \$940,000 to erect, on the grounds of various Paris hospitals, huts for the open air treatment of 2,500 tuberculous French soldiers. It is estimated that the cost of this treatment will amount to \$600,000 yearly.

ASIATIC CHOLERA IN TREBIZOND.—The weekly report of the United States Public Health Service for March 3 states that during the period from December 2 to 4, 1915, fifteen cases of Asiatic cholera with ten deaths were reported at Trebizond, an important Turkish port on the Black Sea.

WAR RELIEF FUNDS.—On March 11, the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	\$103,506.85
Serbian Fund	83,046.76
Allied Fund	67,381.80
French Wounded Fund ...	57,024.98
British Imperial Fund ...	48,625.38
Armenian Fund	34,873.79
French Orphanage Fund ..	31,208.97
Polish Fund	23,361.22
Surgical Dressings Fund ..	19,983.55
La Fayette Fund	19,346.53
Italian Fund	15,522.65
P. S. D. Fund	3,463.50
German Milk Fund	2,032.55

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending March 11, there were 292 deaths reported, with a rate of 20.02 per 1,000 population as compared with 235 and a rate of 16.37 for the corresponding week of last year. There were 42 deaths under 1 year as compared with 37 last year, and 88 deaths over 60 years of age against 71 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 63; scarlet fever, 80; measles, 136; typhoid fever, 6; tuberculosis, 54; whooping cough, 50. Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 16; whooping cough, 1; measles, 1.

Total deaths from these diseases were: Diphtheria, 6; measles, 1; tuberculosis, 27; typhoid fever, 2; whooping cough, 2. Included in the

above were the following deaths of non-residents: Tuberculosis, 1.

AN EMERGENCY HOSPITAL UNIT IN BOSTON.—It is announced that, in accordance with the plans of the American Red Cross for preparedness, a movement has been initiated to organize an emergency hospital unit in Boston. A representative of the Society has recently visited this city to investigate the adaptability of the large local hospitals for this purpose. The hospitals particularly visited were the Boston City Hospital, the Massachusetts General Hospital and the Peter Bent Brigham Hospital. Investigations were also made of the facilities for transporting injured from the harbor and railroad stations to the several hospitals on short notice. The water approaches to the City Hospital were particularly studied to determine whether the wounded could be transported thither from the harbor with sufficient ease to make the hospital of value as a naval base. Dr. E. H. Nichols of Boston has been named as organizer of the Boston unit for the United States.

"According to the officials of the hospitals, more than 4,000 men could be taken care of in hospitals here should the necessity arise. The City Hospital alone can handle 1,500 bed patients in an emergency.

"The unit when completed will be composed of about 200 surgeons, physicians and nurses. Their duties will not be confined to work in the city alone in time of war, as they will be subject to government orders and may be detailed to field service or duty in any section of the country where they may be most needed. It is believed they will be officially termed as a branch of the Red Cross.

"According to reports, it is also planned to have Boston a concentration centre for supplies needed for hospital and military work in this section. No official statement regarding this report has been secured."

BABY WEEK IN BOSTON.—The practice of appointing a special day or week to emphasize and teach to the public at large the cardinal principles of hygienic living is rapidly becoming a custom. Boston in keeping so-called "baby week" has enthusiastically taken occasion to bring into prominence its campaign for not only reducing its infant death rate, but also spreading abroad information for giving to its babies a heritage of health and strength.

Various organizations, including women's clubs, the Instructive District Nursing Association, and the Milk and Baby Hygiene Association, have been instrumental in making the plan as successful as possible. Meetings have been held in various parts of the city and suburbs and the places of the meetings have included schools, department stores, churches, public libraries and club houses. Addresses have been made by physicians especially

engaged in the care of infants and by others who have special knowledge of the field of infant welfare work. There is every reason to suppose that results of such a widespread campaign, carried on with all due publicity, may maintain in this city and elsewhere a high standard of efficiency in the prevention of unnecessary infant deaths and look toward the establishment of a degree of knowledge in matters of health which must be the endeavor of every enlightened community of the present day.

REPORT OF THE BUTLER HOSPITAL.—The Butler Hospital of Providence, R. I., which treats cases of mental disease only, presents its report of the year ended December 31, 1915. The total number of patients treated during the year was 288 and the discharged numbered 145. Of the discharges, two patients were unchanged, 28 had recovered, 70 were improved, 15 were unimproved and 30 had died. Regarding its treatment of patients the report states as follows:

"In considering results of treatment it is always enlightening to review the duration of the sickness before the patient came under hospital care. Dividing all cases admitted during the year upon this basis, we find the largest group comprising patients who had been ill from two to three months. This group shows about 25% of all admissions. Twenty-three per cent. had been ill one month or less, and seven per cent., two years. The remaining 45% varied in duration from five weeks up to, in one case, sixteen years.

"If the profession and public would unite to seek early treatment in mental and nervous diseases, much better results could be obtained, both in private and hospital practice. Most of the cases received during the past year were such as should have been brought under treatment in the inception of the disease. Delay had meant always a longer duration of the illness and but too often irreparable damage. Obviously, our percentage of recoveries would be greater if cases could be admitted during the first weeks of illness instead of during the first few months, or, indeed, years. And yet, as our records show in most striking fashion, mental disease that has lasted months or years instead of weeks is by no means always incurable. We have had at least four cases of over seven years' duration that recovered entirely. One patient, sick in the hospital for nine and a half years, recovered and took up active work. A second, sick for eight years, mention of whom was made in a previous report, has been well for over two years and has resumed her work as a music teacher. Two others, ill for between seven and eight years, are now enjoying normal health and activities. With our increasing knowledge of the morbid processes affecting the nervous system, it is not too much to hope to add other cases to this rather unusual group of retarded recoveries."

Miscellany.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR FEBRUARY, 1916.

THERE has been a marked decrease in the number of communicable diseases reported to the health department of this state during February. During January, 1916, there were 5143 reports of cases received, while in the month just closed there were 3984. As compared with February, 1915, there was a slight increase, due to the presence of an unusual amount of measles and whooping cough. The decrease in the communicable diseases has been general over the entire state.

The preventable diseases continue their systematic slaughter. Diphtheria scored 49, whooping cough 20, scarlet fever 17, and measles 16 deaths during February, to say nothing of the 328 lives taken by tuberculosis.

Diphtheria has manifested some hopeful signs,—the fatality rate being 6.8 per hundred cases during February, while it was 8 per hundred cases during January. It is to be hoped that this is not an accident, but is due to better reporting, earlier diagnosis, and more prompt administration of antitoxin. A combination of Massachusetts parents, physicians, and public health officials can stamp out diphtheria.

Scarlet fever seems to be less virulent. The fatality for February, 1916, is 2.2%, while for the same month last year it was 4.9%.

Whooping cough and measles continue to present the most difficult problem. These diseases are accepted by the public as harmless, their prevention has been proven difficult by experience, and many health officers have given up the problem as insoluble. These two infections caused a total of 36 deaths last month. While the problem is a difficult one, it seems that we should be making some serious efforts to prevent the unhindered spread of these diseases. In many cities and towns they are practically ignored.

While there has been a general decrease in the communicable diseases in all parts of the state, in certain communities a few of the infections are unusually prevalent. In the following cities and towns there has been a decrease in the number of cases of measles: Chelsea, Lawrence, Lynn, Salem, Saugus, Winthrop and Webster, while in Newton, Lowell and Fitchburg this disease seems to be on the increase.

Diphtheria has shown a gratifying decrease in the number of reported cases. This is true in comparison with last year, as well as in comparison with the month of January. There

has been a decrease in the number of cases in the following cities and towns: Cambridge, Fitchburg. In Lowell, Haverhill, Leominster and Lynn there has been a slight increase in the number of cases.

Scarlet fever has decreased in almost all of the cities and towns where it was unusually prevalent last month. This is true in Cambridge, Worcester, Northampton and Lynn. In the last named city, while there has been a decrease, the number of cases still remains above the "normal average." Brookline, also, has an unusual number of cases.

Whooping cough is still distributed widely over the state. However, there has been a decrease in the total number of cases, both as compared with last month and with the same month last year. There has been considerable decrease in the following cities and towns: Cambridge, Mansfield and Melrose. There has been an increase in Brookline in whooping cough.

Tuberculosis continues to show the influence of the dispensaries in the increased number of cases reported each month.

Typhoid fever has shown a remarkable decrease in the number of cases reported. During February, 1915, there were 91 cases, while during the month just closed there were but 39. The epidemic reported in last month's bulletin at Fall River has been entirely controlled by the prompt action of the local board of health.

There have been no epidemics during the course of February.

During February there have been reported two cases of anthrax, one at Peabody and one at Worcester; three cases of pellagra, one in Boston and two in Danvers; and five cases of trichinosis, two in Boston, two in Worcester, and one in Newton.

Correspondence.

AN AMERICAN ASSOCIATION OF GENERAL PRACTITIONERS.

Mr. Editor: The present is a time of organization in all departments of the arts and sciences, and in social matters also. All the specialties in medicine and surgery have their organizations and the holier-than-thou surgeons have their special and exclusive one. Many of these at every opportunity appear to be interfering with and imposing upon the members of the medical profession known as general practitioners who are on the firing-line and dealing with emergencies and exacting conditions of every kind constantly. With plenty of laboratory facilities now at command, if they have not time to use their own, the family physicians who study, observe and know the constitutions, tendencies and interests of their clientele, understand them far better than any strangers can, however super-human such may assume or imagine themselves to be. Even some druggists' associations are trying in every state, for their own commercial ends, to interfere with the physicians' ancient rights and duties, and make them and their clientele subservient to the druggists' commercial interests. A surgeon cannot render his best and most efficient serv-

ice to a patient unless he has his instruments right at hand to use as needed. A physician cannot render his best and most efficient service to a patient unless he has his instruments (medicines) right at hand to use as needed, and, being so prepared, he can save many precious lives which would otherwise be surely lost by delay. The physician should have most of his remedies with him when he enters the sick-room. All the important remedies are now prepared by the best pharmaceutical houses, ready for instant use. Many of the hospitals, dispensaries, etc., that appear to be mis-managed and their resources perverted by dominating spirits, seem to be of no benefit whatever to the general practitioners in their work for the masses of the people, but rather a decided hindrance and injury by their pauperizing methods and mistaken diagnoses as shown by autopsies and subsequent histories of cases treated there. The time has come when the men in the general practice of medicine and surgery must organize as they are not organized nor ever have been before.

A national association composed of physicians and surgeons in general practice should be organized *at once* with branches in every state, called, if you please, The American Association of General Practitioners, or other suitable name, for the protection of their rights, duties and efficiency, and the interests of their clientele, and to have a voice in matters concerning them. There is no time to be lost. Let the physicians and surgeons in general practice throughout this country awake from their lethargic sleep and be stimulated to heroic deeds and maintain their rightful place in the sun, unless they are content to be dominated and insulted by well-paid, self-assuming, dictatorial hospital rings and others of similar nature with their advertising and soliciting methods of obtaining patients and their persistent follow-up methods of retrieving them and usurping, by any and every means, the rightful place of the family physician, while at the same time rendering less individualized and efficient service, notwithstanding their spurious and misleading claims and advertising.

EDWIN A. SANBORN, M.D.

24 Franklin St., Somerville, Mass.

DUPUYTREN AND APPENDICITIS.

Mr. Editor: In the "Leçons Orales" of Dupuytren, first published in 1832, occur the following interesting passages. The heading is "Abcès de la fosse iliaque droite." Translated, it reads:

"The inflammations and diseases of the appendix of the coecum, of which I have seen a considerable number of cases, have hardly received any attention from medical writers, and I must give credit to one of my pupils, Dr. Meller, for an excellent work on the lesions of this organ."

The following case is reported:

"Perforation of the appendix of the coecum, with a fistulous communication with the abdominal wall in the right iliac fossa." The case, after running a protracted course, finally terminated in death from an acute general peritonitis, which was started by a fresh rupture of the old walled-off abscess cavity. At autopsy, the peritoneal cavity was found to contain about three litres of reddish serum in which floated flakes of fibrin, with a few concretions; a similar exudate bound together most of the intestinal coils; the surface of the intestines was also inflamed. The part of the abdomen that had been the seat of the swelling was examined with care. The skin here was thinned and was perforated by four openings, which all communicated and led to a large opening or sort of pocket between the muscle fibres of the abdominal wall and the external surface of the peritoneum; to this pocket part of the coecum was adherent, and the appendix of the coecum was perforated here, and it could not be traced further. All this disorganized tissue seemed to be local and seemed only to rep-

resent imperfectly the original volume and shape of the tumor. It seemed a sort of cloaca, in which the appendix vanished.

In the course of his lecture, Dupuytren says:

"These abscesses present some unusual characteristics, that is, the pus finds its way into the lumen of the intestine without fecal material being always deposited in the abscess cavity. Three reasons can be given for this: the first is that these abscesses empty gradually, the intra-abdominal pressure being accountable for this, without which fecal material would be introduced. The second reason is on account of the obliquity of the perforation, and the third on account of the injury to the intestinal wall. In some cases, luckily rare, the inflammation extends rapidly from the right iliac fossa to the whole peritoneum, and in some others at the same time to the post-peritoneal cellular tissue. It is even probable that in some cases the inflammation attacks the peritoneum first, but locally, being spread only from the right iliac fossa to the rest of this membrane. Death may be the result of this extension of the malady. Such an extension of the malady should always cause us anxiety."

Those careful deductions from clinical data bring out one of many of the now forgotten achievements of this incomparable surgeon. They also give a realization of how much was known, its significance partly grasped and then forgotten, only to have the complete significance of the phenomena realized at a much later date.

Yours very truly,

WILLIAM PEARCE COUES, M.D.

Boston, March 1, 1916.

NOTICE.

THE EIGHTH AUTHORS' EVENING of ten papers on "Activities of the Speech Mechanism among the Psychoses" by Walter B. Swift, M.D., in charge Voice Clinic, and Caroline A. Osborne, M.D., Ph.D., First Assistant, at the Voice Clinic, Psychopathic Hospital, 74 Fenwood Road, Brookline, Mass., March 27, 1916, at 8 P.M.

Introduction: Historical References.

1. Speech in a Case of Tabo-Paresis.
2. The Vocal Negativism of Dementia Praecox.
3. A Speech Sign in Korsakow's Psychosis.
4. Minor Points in General Paralytic Utterances.
5. Vague Findings in Ten Dementia Praecox Cases.
6. Vocal Colorings in the Manic-Depressive Psychoses.
7. Senile Dementia and Its Vocal Signs.
8. Speech of the Juvenile General Paretic.
9. The Speech as a Key to the Psychotic Mental Content.
10. May the Speech be an Avenue for New Methods of Treating the Psychoses?

You are invited. If you expect to attend, send word to 110 Bay State Road, Boston.

SOCIETY NOTICE.

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the hospital on Tuesday evening, March 21st, at 8.15 o'clock.

PROGRAM.

1. Exhibition of cases.
2. "Studies in Experimental Pneumonia." Dr. L. H. Newburgh, Dr. J. H. Means, and Professor W. T. Porter.
3. "Studies of the Renal and Coronary Circulation." Dr. A. A. Ghorev.

Medical students and physicians are cordially invited. Telephone, Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the hospital.

APPOINTMENTS.

OHIO STATE UNIVERSITY. Dr. Eugene F. McCampbell, secretary of the Ohio State Board of Health, has been appointed dean of the College of Medicine of the Ohio State University in place of Dr. William J. Means, who has resigned.

UNIVERSITY OF WÜRZBURG.—Dr. Waldemar Schleipp, formerly associate professor of zoölogy, University of Freiburg, has been called to the professorship of comparative anatomy at the University of Würzburg to succeed the late Dr. Boveri.

NORTHWESTERN UNIVERSITY. Dr. Thomas Lewis Gilmer has been appointed dean of the Dental School of Northwestern University.

SMITH COLLEGE. Dr. Joel E. Goldthwait of Boston has been appointed professor of hygiene and physical education.

RESIGNATION.

COLUMBIA UNIVERSITY. Dr. Gorham Bacon has resigned as professor of otology in the College of Physicians and Surgeons, New York, to take effect at the close of the present academic year.

RECENT DEATHS.

DR. JOSIAH WARREN BALL, who died recently in Boston, was born at Holden, Mass., on June 28, 1841. In 1861 he joined, as a volunteer, the Third Battalion of the Massachusetts Volunteer Militia and subsequently served throughout the Civil War in the First and Second Massachusetts Cavalry Regiments. He was promoted for gallantry to be a lieutenant and was honorably discharged from service in April, 1865. He subsequently studied dentistry at Worcester, Mass., and Marion, Ala., and on returning to Boston ultimately was graduated from the Boston Dental College in 1870. He was a member and a former president of the Massachusetts Dental Society and for several years was instructor in operative dentistry at the Boston Dental College. He is survived by his widow.

DR. LUTHER O. MARTIN, who died of cardiac disease on March 3, at Springfield, Mass., was born at Cheshire, Mass., in 1854. He received the degree of M.D. from the Medical College of Columbia University. He first practised his profession at Petersham, Mass., but in 1880 removed to Colorado. He had been a resident of Springfield since his return to the East in 1900.

DR. BENZION G. WERNICK died at his home in Roxbury, February 23, 1916, aged 48 years. He was a graduate of the Tufts College Medical School in 1903, and joined the Massachusetts Medical Society the following year.

BELGIAN PHYSICIANS' RELIEF FUND.

Report of the Treasurer of the Committee of American Physicians for the Aid of the Belgian Profession, for the week ending March 4, 1916:

No contributions for week ending March 4, 1916.		
Previously reported receipts	\$7,941.86	
Previously reported disbursements		
1,625 st'd boxes food at \$2.20	\$3,575.00	
1,274 st'd boxes food at \$2.30	2,930.20	
353 st'd boxes food at \$2.28	804.84	
Total disbursements	\$7,310.04	
Balance	\$ 631.82	

F. F. SIMPSON, M.D., Treasurer,
7018 Jenkins Arcade Bldg.,
Pittsburgh, Pa.

The Boston Medical and Surgical Journal

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Address.

SOME PRESENT DAY PROBLEMS IN SURGERY.*

BY MICHAEL F. FALLON, M.D., LL.D., F.A.C.S.,
WORCESTER, MASS.

*Surgeon-in-Chief, St. Vincent Hospital,
Worcester, Mass.*

THE address, which I have the honor to present to you, was prompted by the remark of an estimable country physician with whom I recently spent an evening. He said that his study of some surgical subjects frequently resulted in mental confusion because of the many conflicting views in surgical literature. "Consider," he said, "the vast amount of literature—pro and con—in reference to Lane's doctrines. How can country doctors, isolated as we are, come to any conclusion in reading so many conflicting opinions?"—orthodoxy in one mail; heresy in the next.

Since our society is composed mostly of physicians, the writer, in this address, has tried to avoid a discussion on surgical technique, and gives his view-point on some present day problems in surgery gleaned from the studies of the results of master surgeons; and he takes the liberty to add some data observed by himself in his surgical investigations.

INTESTINAL STASIS.

Probably the most discussed surgical subject today is that of "intestinal stasis," and the

* Read before the Worcester District Medical Society, December 8, 1915

champion for certain surgical procedures for relief of this ailment, Mr. Lane, says:¹

"By chronic intestinal stasis, I mean that the passage of the contents of the intestinal canal is delayed sufficiently long to result in the production, in the small intestine especially, of an excess of toxic material, and in the absorption into the circulation of a greater quantity of poisonous products than the organs which convert and excrete them are able to deal with.

"In consequence, there exist in the circulation materials which produce degenerative changes in every single tissue of the body, or which lower its resisting power against invasion by deleterious organisms.

"Owing to unsuitable diet in infancy and to habitual assumption of the erect position, delay of fecal material takes place in the large bowel, or cesspool, of the gastrointestinal tract, or, as it can be best described, the 'general drainage system of the body.'

"In consequence of this, new membranes or resistances to downward displacement are formed by the crystallization of lines of force upon the surface of the peritoneum along which strain is especially exerted."

As regards treatment, Mr. Lane says:

"The point of practical interest is that the drainage scheme be made to work efficiently by mechanical means, or by operative interference, and that the resisting power of the tissues of the body is such that they can destroy the organisms or poisons, if not advanced too far, or if cancer has not developed.

And nothing is more remarkable in the whole range of surgery than the result of the removal of the large bowel in a case of rheumatoid arthritis. The transition is abrupt and startling."

Lane's theory as to "intestinal stasis and auto intoxication" resulting from kinks, new membranes, visceroptosis, is not new.

Glénard, in 1855, gave an accurate description of ptosis of the viscera, and he ascribed, as a cause for constipation, the kinks (angulations) due to visceroptosis.

Virchow, as far back as 1853,² described the peri-colic membrane due, he thought, to fecal stasis.

The theory of auto-intoxication due to intestinal stasis was advocated years ago by various medical men, *e.g.* Bouchard, Combe. Hence, there is nothing new about Lane's theory.

The term intestinal stasis is rather a novel one devised by Lane for the more prosaic one of chronic constipation. It is not, as yet, proved that constipation causes auto-intoxication; and the symptoms that the term auto-intoxication—a vague term—means to convey may, in reality, be due to various diseases, *e. g.* mal-nutrition or to various nervous phenomena.

Lane's theory and his operative procedures based upon this theory have not been generally accepted as a clinical or surgical pathological entity. In fact, the opinions of many medical scientists concerning Lane's views may be summed up in the characterization of them by Adams: "They seem to be a horrible jumble." The frequently obscure syndrome of abdominal symptoms—pain, constipation and gas-distention—have, during the past few years, given rise to other theories as to their causation. And next to Lane's theory, perhaps the one most discussed is the so-called movable cecum (Cecum Mobile, Wilms).

Formerly, chronic appendicitis was generally held responsible for symptoms of pain and constipation, but when operative results of many surgeons were made known, it was found that frequently these symptoms continued despite the ablation of the appendix. (Wilms says that 30% of operations for chronic appendicitis are disappointing).

Another theory advanced to explain these symptoms is that of the too-restricted cecum, the opposite of the too-movable cecum; and the too-restricted cecum is said to be due to a pericecal membrane accurately described by Jackson.

The respective advocates of these two conditions—the too-movable cecum and the too-restricted cecum—who wish to establish them as pathological entities, claim that the too-limited movements of the cecum (due to Jackson's membrane), and the too-free movements of the cecum (cecum mobile), cause a mechanical interference with the first part of the large intestine, with resulting stasis, and may thus cause pain, constipation and gas-disturbance.

Various surgical procedures applicable to these two conditions have arisen, and even now are somewhat practised. Briefly, these surgical procedures are: In the case of the too-movable

cecum to bind down the intestine to the parietal peritoneum, and thus limit its too free movements. In the case of the too-restricted cecum, on the other hand, to loosen up the cecum and ascending colon by cutting the enveloping membrane. (Jackson's membrane).

Sufficient research work, both clinical and surgical, warrants, I believe, a final judgment as to whether these two conditions be accepted as pathological entities. The opinion among surgeons in general, as in the case of Lane's theory, is against so accepting them, since investigations have shown that the too-movable cecum occurs frequently enough to be called normal, and that Jackson's veil is always present and is a normal structure. (The writer ventures an opinion as to the pathology of the movable cecum, and of Jackson's veil, inasmuch as he has studied these structures on the operating table, and has examined one hundred consecutive subjects in the Harvard Medical School with reference to them. In both the operating and dissecting room, he has found that the movable cecum is present in about one-fourth of all subjects; and Jackson's veil is always present).

The writer, in 1913, said:³

"There is a great deal of confusion in the various theories as to the cecum and the surrounding membranes being the source of constipation and pain, and in some of these theories, a very important physiological fact may be lost sight of, *i.e.* that digestion in man requires the retarding of the food current in the ascending colon. The accumulation in the beginning of the large intestine, in itself, is not pathological.

"Sonnenburg,⁴ Huntington,⁵ and Cannon⁶ have shown that many of the features of the large intestine instead of being a menace to the well-being of man (Metchnikoff, Lane) are, on the contrary, most admirably adapted to the completion of his digestion.

"Food in transit from the stomach to the anus usually requires from 24 to 36 hours, only 6 to 8 of which are occupied by the small, and the remainder by the large intestine. Most of the nutriment is absorbed in the small intestine, but about 50% of the fluids, and 10% of the solids are absorbed in the first half of the large intestine; and here necessarily, because of the character of the nutriment, a longer time is necessary for absorption. Even the anatomical, up-hill arrangement of the ascending colon serves a physiological purpose.

"The splenic flexure of the colon is held high as a mechanical means of maintaining food products as long as possible in the first half of the large intestine. This method of retention is more economic in its operation than a muscular sphincter apparatus would be."

"Even when the cecum is of moderate size or rudimentary, as in the cat, prolonged retention of the material delivered by the small intestine is provided for in the reversed peristalsis which prevails in the proximal colon.

"Food, rich in cellulose, may remain in this region (cecum) for days undergoing changes which result in its being utilized in the body. On the

other hand, in carnivorous animals, digestion occurs principally in the stomach and small intestine; the cecum is either rudimentary or absent.⁶

"Therefore, the construction of the large intestine in man with its accessory modifications⁵ favors the retarding of the food current in its first portion for physiological purposes; and when this retarding amounts to a pathological stasis, with its accompanying symptoms of pain and constipation, the causes may be sought for elsewhere, and frequently may be traced to faulty habits and neglect of physiological laws. It is a noteworthy fact that this pathological stasis obtains mostly in women (75% Wilms'), and is frequently associated with gastrocoloposis."

Hence, obstinate constipation of functional origin, and its concurrent symptoms, should be treated by hygienic, dietary and therapeutic rather than by surgical measures. Ileocolostomy or colectomy at times is advisable in organic disturbances of the bowel, *e.g.* cancer, but not in functional disturbance. (One use of the colon is to be sure, as Lane says, that of a "sewer," but the colon has physiological uses other than those of a "drainage tube," and it has been shown that, even though a man may live without a colon, the ablation of the colon leaves the patient vulnerable to many dangers, and especially to certain intestinal disorders.) William Mayo, in his matter-of-fact way, briefly and wisely sums up such radical procedures on the gastrointestinal tract: "That many of the patients operated on have been greatly benefited cannot be denied, yet, if one were to take the case histories and reports of successful treatment by means of such mechanical therapy, and put them all in a hat to be picked out at random, one could not determine from the histories of the patients those who had been relieved of symptoms by operating for mobile cecum, for relief of adhesions, for mobility of the sigmoid, for fixation of the sigmoid, for prolapse of the stomach, and, for that matter, for movable kidney. The histories read alike, but the operations seem to vary with the bias of the operator. Are all of these deductions wrong? Have the profession in regular medicine, with their accurate observations, no conclusions which depend upon more authentic data? To say that relief of symptoms demonstrates the truth of the opinion is not sufficient unless we grant the same privilege to the mental healers." As regards the advocacy of many of the radical operative measures on the gastrointestinal tract for the syndrome of symptoms of pain, gas-distention and constipation, the remark of Caesar may be applicable. He said: "Most men willingly believe what they wish to believe." The scientist, and this applies to other than Christian scientists, becomes interested in his hobby; and he develops that hobby by making all his evidence support it. Mr. Lane's associate says that he had never noticed the obstructing membranes in red-haired wo-

men! No wonder that a conscientious physician becomes confused in his conduct of such cases.

I have often thought what a blessing it is for the people of this community that our local physicians and surgeons do not lend themselves to such radical and often death-dealing measures as are advocated by the champions of various new operations on the gastrointestinal tract.

PRESENT DAY ATTITUDE CONCERNING APPENDICITIS.

Dr. Mixer¹⁰ has well said, "Probably more necessary operations on the appendix have been left undone, and more unnecessary operations have been done on it than on any other organ in the body." Surgeons and physicians today, with very few exceptions, advocate an immediate operation in an undoubted case of acute appendicitis. But at times, it is impossible for most experienced surgeons definitely to diagnose appendicitis when the abdominal symptoms are obscure and do not point positively to the appendix as the offending organ. A chronic appendix not infrequently gives symptoms that are misleading.

We know now that many cases of so-called dyspepsia are, in reality, due to chronic appendicitis. Ulcer of the stomach is not infrequently diagnosed when, in reality, the lesion is appendicitis. Perhaps there is no surgeon whose conclusions on abdominal diseases are more reliable than are those of Moynihan.¹¹ He thus writes concerning the mimicry of ulcer by appendicitis. "There is no longer any doubt in my own mind that the commonest site of a 'gastric ulcer' is in the right iliac fossa, and generally from appendicitis. In many of the cases of gastric ulcer, the symptoms of which are pain, flatulence, acidity, heart-burn, vomiting and hematemesis, the lesions primarily responsible for such symptoms do not lie in the stomach. The lesion is one in which infection and obstruction are in league to do harm, and its most frequent location is in the appendix."

It is the experience of every surgeon to see gastric symptoms clear up after the removal of the appendix. I recall the case of a physician of our Society. He had been sorely troubled for years with an apparent stomach ailment; he was operated for acute appendicitis, and after this, he had no more trouble with his stomach. This case was to me particularly instructive from the stand-point of diagnosis, since even this physician, an up-to-date man, located his trouble because of the gastric symptoms, in his stomach, when, in reality, the appendix was the sole cause of it.

There is no question that the appendix is the most potent and most frequent cause of offence in the abdomen. Most cases of appendicitis are easily diagnosed. What should be our procedure in ill-defined abdominal cases in which we cannot be positive, but in which the preponderance of evidence points to the appendix? In all such cases, when other abdominal diseases

can reasonably be eliminated, the removal of the appendix will generally give the patient relief. At times, in some obscure cases, when the evidence points to the appendix, the history of appendicitis in some other member of the family will aid in the diagnosis. In the writer's experience, about one-fifth of the patients operated for appendicitis give a family history in which one or more members have had appendicitis.

GALL-STONES.

What is the present day practice in regard to gall-stones? In advanced gall-stone cases, when no contra-indication exists, there can be but one opinion; and most surgeons now favor the removal of the gall-bladder—an expansion organ, and not a reservoir for bile, as formerly thought. There is a difference of opinion as to the advisability of operation in so-called "latent" gall-stone cases, but the term "latent" gall-stone is fast falling into disuse, since we now know that a gall-stone is evidence of obstruction and infection. "Every gall-stone is a tomb-stone erected to the evil memory of the germs that lie dead within it" (Moynihan); and the patient with gall-stones is very apt, sooner or later, to become aware of having what Carlyle, in his own case, termed an "infernal machine" inside of him.

If gall-stones confined their ravages to the gall-bladder, the let-alone policy might be permissible; but we now know that gall-stone infection may cause sepsis, liver, kidney and heart disease, and various other diseases from infection and interference with assimilation; the same treatment of early operation in appendicitis should also obtain when gall-stones are present, *i.e.* early operation, and the earlier, the better for both patient and surgeon.

The gall-bladder is, in many respects, like the appendix—both are hollow organs lined with mucous membrane, and in both, infection and obstruction may result in all grades of inflammation, simple, catarrhal, suppurative or gangrenous. The danger from early operation is so remote that it is not to be compared with the danger of the disease itself. We should never forget that while operation in advanced cases of gall-stone disease may remove the source of the trouble—the gall-stone—the many and various evil results of gall-stone disease, as enumerated above, are not cured by operation.

There is a phase of gall-stone disease, and also of chronic appendicitis, that appeals to every surgeon—that is, the neurasthenic side of these diseases, for it frequently happens that the patient with these diseases is told that he has neurasthenia, and is advised to try to forget it. It falls to the lot of every surgeon to cure neurasthenia by removing these faulty organs. Another strong argument for early operation in gall-stone disease is the consideration of the welfare of the surgeon himself, since there is no class of cases so productive of worry to the

surgeon as is the class of gall-stone disease with various disasters that may attend operations in late gall-stone cases, because of the lowered resistance in these cases.

PELVIC CASES.

No surgical procedure has undergone a greater change of late years than the conduct of cases of Neisser infection of the female genitalia. Formerly, and not so very long ago, the acutely infected tubes and ovaries, and frequently the uterus, were excised without hesitation; but no surgeon advised or practised the removal of the corresponding organs in the male when similarly affected! When it was found that acute adnexitis in women, of Neisser origin, as a rule, subsided without interference, then surgical treatment of this disease became the exception; and today, as a rule, radical operation is not done in acute Neisser pelvic infection. If after a reasonable period, the patient is incapacitated by reason of the results of this disease, then proper surgical methods may be indicated. The ill-timed radical excision of the genital organs in the female that obtained in the past—unsexing, mutilating, precipitating severe nervous phenomena, and at times, destroying life—can not be looked upon now other than as a "*bête noire*" of pelvic surgery.

Our present day treatment of certain other affections in women may, however, partly atone for this, since now surgery plays a prominent part in the management of some obstetrical difficulties, especially, placenta prævia, puerperal eclampsia and narrow pelvis.

Caesarian section when done under proper auspices, and when rationally indicated in such cases, exemplifies the highest type of conservative surgery. In properly selected cases of placenta prævia and narrow pelvis, a Caesarian section gives two lives instead of one, and frequently, two lives instead of two deaths. Caesarian section may be much safer for mother and child than is a difficult high forceps in a narrow pelvis, or in uncontrollable bleeding in placenta prævia.

A discussion of pelvic surgery would be incomplete without reference to the "Schauta-Wertheim" operation for complete prolapse of the uterus. This operation is wholly carried out through the vagina; the uterus is interposed between the anterior vaginal wall and the bladder, thus fixing the uterus so that it cannot further prolapse; the bladder is supported by the underlying uterus, and lifted into the abdominal cavity, and the relaxed outlet is properly repaired.

In most cases of prolapse of the womb, this operation is the most rational and effective, and it carries but little risk. It is now the operation most frequently done, and has replaced the old irrational, generally ineffective, and frequently mutilating abdominal operation for prolapse.

CANCER AND ULCER OF THE STOMACH.

We are appreciating, more and more, that it requires an all-around knowledge of the whole man properly to diagnose stomach disease. The stomach is frequently the spokesman for the ills of its neighbors. Less than 10% of people who complain of stomach trouble have, in reality, a disease of the stomach. Good surgical results in stomach disease depend upon a good diagnosis. The history of the patient is still the most important thing in making a diagnosis, and the x-ray examination is indispensable in both cancer and ulcer cases.

There is no question that some of the stomach surgery done in past years has been not only useless, but harmful, and the trouble generally has been in the improper selection of cases for operation. Operation on the stomach may be harmful when the lesion is in other organs, such as the appendix, or gall-bladder, or when the lesion of the stomach, such as ptosis, may contraindicate certain operations such as gastro-enterostomy. No operation in surgery gives a more gratifying result to both patient and surgeon than an operation for a properly selected case of gastric or duodenal ulcer, and delay in operation in such cases frequently means suffering, incapacity and at times death to the patient.

The stomach is a very fertile field for cancer; almost one-third of all cancers of the human body occur in the stomach; and cancer of the stomach treated by other than surgical methods results in 100% mortality. Hence, many cases of cancer of the stomach in the early stages should be given the benefit of surgical treatment just as much as when the cancer exists elsewhere in the body. We are realizing, more and more, that many of the defects of the stomach are of mechanical origin causing stasis, and that the cure is only mechanical. Even the so-called catarrh of the stomach is frequently symptomatic of a mechanical impairment. The study of the motility of the stomach is now rightly regarded as of the highest importance in diagnosis and treatment.

ANESTHETICS.

No discussion of present day problems would be complete without reference to anesthetics. Despite the claims put forward by champions of various other anesthetics, the anesthetic most generally accepted, both here and abroad, as a safe and sane anesthetic, is ether, given to us by a native of Worcester County—Morton.

While the chemical ether remains the same, the method of giving it has improved. Now, the open drop method is not only safer, but in every way more comfortable for the patient. Bevan, in an article, "The Choice of Technique of the Anesthetic,"¹² admirably sums up his study of various anesthetics. "Ether, by the open-drop method, is the safest general anesthetic known for producing prolonged anesthesia. It should be today the standard anesthetic in

the surgical clinic. The discomfort of ether anesthesia, when properly given by the open-drop method by an expert, can usually be practically eliminated. The closed method of giving ether is not so satisfactory or so safe as the open-drop method. Complicated apparatus to control the percentage of ether, and to warm ether, possess no advantage over the simple drop method, and should be discarded. The giving of ether by the drop method is an art which must be acquired under the instruction of an expert."

In this paper, I have purposely refrained from a discussion of methods concerning surgical technique, inasmuch as our Society is composed mostly of physicians; and then, too, there have been no startling advances in abdominal surgical technique the past few years. Even now, the operation of choice in pylorectomy and partial gastrectomy is the one first successfully done by Billroth in 1881.

In 1881, also, the first gastroenterostomy was done by Wölfler at the suggestion of his assistant, Nicalodoni. (The first gastroenterostomy, to be sure, was an anterior one). Again, in 1881, Rydygier operated for the first time on gastric ulcer. The technique of cholecystectomy, of intestinal anastomosis, of hysterectomy, of salpingo-oophorectomy, of Caesarian section, has not changed materially of late years, and Bassini's operation for inguinal hernia, first done in 1885, is still the operation of choice for hernia. But while there have been no very startling advances in abdominal surgical technique in the past few years, the surgical results, in general, of today, are far better than they were previously. We have learned by the mistakes of our predecessors. Many useless operations have been tried and found wanting.

Abdominal surgery is settling down and becoming more conservative where conservatism is called for, and more radical where thoroughness is indicated. "*Qui bene diagnoscit, bene curat,*" applies equally to the surgeon and to the physician; and the physician now, with all the diagnostic aids at his command, helps the surgeon more than ever in the proper selection of surgical cases. The follow-up system in surgical cases, so widely and rightly advocated, will not be so difficult in the doing when both the physician and surgeon put in the suitable time and study in the go-before methods of diagnosis.

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Original Articles.

THE CARNIVOROUS AND HERBIVOROUS TYPES IN MAN: A REPLY TO DR. HOOTON.

BY JOHN BRYANT, M.D., BOSTON.

THE writer being personally and solely responsible for the application of the words "carnivorous" and "herbivorous" as used to describe two very obvious types of human development, Treves²² having used these words only in connection with the lower animals, Dr. Hooton's recent article¹² in this JOURNAL takes on somewhat of a personal character.

Dr. Hooton objects, first, to the use of the term "herbivorous." If to Dr. Hooton's mind the word herbivorous conveys the idea of "grass eater" rather than vegetarian, it is suggested that he consult the Century Dictionary or some standard medical dictionary.

The terms carnivorous and herbivorous were chosen after due consideration to signify the two types which have been described as existing in the human, for two reasons: First, although not ultra-scientific, they are descriptive and call to most minds a definite mental picture of a complete organism; secondly, diet is about as near as we can get to fundamentals in the living, since without food we die, and it is more to variations in diet in the young than to any other one factor, except perhaps heredity, that type differences in the adult are due. It is obvious that the recognition of type is a means rather than an end, and equally obvious that recognition is far from infallible; but one cannot work much with type without more and more realizing that it is a valuable aid in the diagnosis and treatment of disease.—disease not as the anthropologist knows it upon the dusty bones of his averages, but as the medical man finds it in the living tissues of his individual patient.

Herein lies one of Dr. Hooton's fundamental misconceptions. If his paper is representative, the points of view of the anthropologist and the physician are irreconcilably at variance. The former is essentially a socialist, constantly engaged in reducing the individual to the one deadly level of a mediocre average for a race. This pessimistic and depressing method would deny the existence of a genius. Modern medicine, on the other hand, is constantly becoming more and more individualistic, hoping by the conservation of a genius to add occasionally to the progress of the mediocre mass with which anthropology appears chiefly to concern itself. The anthropological unit appears to be a race. The unit of type is the individual. Thus the study of type is at once more specialized and yet more broad than the study of anthropology. On the one hand, race and ancestry seem paramount. On the other, race and ancestry are of

only passing and theoretic interest. The concern of type is with the healthy or sick but living individual, within the race or of all races. The living patient is the problem of today, not of yesterday or of tomorrow. Whereas both types occur in every race, it is yet possible to compare individuals of a given type in several races.

Two practical illustrations of the application of observations upon type variations will perhaps suffice. The figures in both cases are from unpublished preliminary investigations, and quoted through the personal courtesy of Dr. Lewis,¹³ and Dr. Hodskins.¹¹

Dr. Lewis examined over 500 school children in Worcester. Their ages varied from 12 to 16, with the majority at 14. For the total number, disregarding race, the disposition of the types was in the proportion of two carnivores to one herbivore, as follows:*

Normal	10%
Herbivorous	30%
Carnivorous	60%

About 75% of these 500 boys belonged to but four races. This 75% was found to divide as follows:

Nationality	TYPE		
	Normal	Herbivorous	Carnivorous
American	5%	10%	20%
Swedish	1	7	8
Irish	1	4	8
Hebrew	1	2	6

Abbreviating carnivorous and herbivorous to C, and H, it will be seen that for the three races, American, Irish and Hebrew, leaving out the normals, the ratio is C:H::2:1; but the Swedish ratio is very nearly C:H::1:1. In other words, the fact that the Swedish ratio is very different from that of the first three races mentioned is lost sight of if one merely takes the total number of boys and uses the average thus obtained, which is C:H::2:1. This is entirely parallel to what happens when the anthropologist uses his "mean" for a given race. The variants on either side of the "mean" cease to exist.

The second example illustrates the use of type as applied to the study of a given disease, in this case regardless of race. Dr. Hodskins, at the Monson State Hospital, examined 115 epileptic children. In round numbers, about 55% were so-called normal, but on either side of this group there were found 5% H, and 40% C, or eight carnivores for every herbivore. This is certainly a strong leaning toward the carnivorous side of the scale, and supports my prediction to Dr. Hodskins that epilepsy, especially the idiopathic variety, would be found to occur largely among the carnivores. Additional support is gained by the study of the etiology in these cases, the majority of which were between 10 and 14 years of age. For convenience, the eight herbivores were grouped with the 60 normals, and then compared with the 47 carnivores, as follows:

* Note that only 10% of these 500 boys fall within the limits of the classical or text-book normal.

Etiology	Carnivorous	Normal
Idiopathic	22=50%	4=5%
Indigestion	17=30%	7=10%
Organic (other)	8=20%	49=85%

No attempt is made to express the percentages with great accuracy, because there is certainly a possibility of error of 5% or so in the determination of type itself, at the present time. But even so, the figures are striking. For idiopathic epilepsy, the ratio is C10 : N1, for indigestion C3 : N1, but for all other organic causes the ratio is reversed to C1 : N4. In short, idiopathy and indigestion account for 80% of the carnivores, but for only 15% of the normals or herbivores. Conversely, various organic causes account for only 20% of the carnivores, but for 85% of the normal and herbivorous group. These observations are in line with a recent report¹⁷ showing 100% of ptoses and gastro-intestinal disturbances in a series of idiopathic epileptics. It will be observed that age is mentioned in both these examples. It has seemed almost too obvious that in considering type one must have in mind not only age (and also physiological age in children), but such self-evident factors as sex, height, nutrition and disease.

Dr. Hooton has elected to act the medical critic. I certainly should not venture to argue with him on subjects anthropological, but he has seen fit to deny the very existence of type. Since Dr. Hooton's attitude toward type is shared by others than himself, it seems necessary to give in some detail the support upon which rests the theorem of type. With its beginnings lost in antiquity, it found perhaps its first permanent though unconscious record in the drawings of the cave men, estimated as 25,000 years old. These artists¹⁵ always represented the women as corpulent, but the men as lithe, muscular and athletic. Much later, but yet 2,000 years ago, Asclepiades⁹ used the words "sthenic" and "asthenic" to distinguish contrasting bodily types, and Caesar¹⁶, shortly afterward, (200 years or so) remarked upon the mental qualities of the fat men who slept at night and of those other restless individuals with their "lean and hungry faces," whom he preferred* not to have too near him. In art one may contrast, for example, the ideals of female beauty portrayed by Botticelli and Rubens. Almost 300 years ago Spigelius¹⁹ had turned his attention to the length of the intestine in its relation to body length, and had recorded a ratio which in a general way holds good today. In 1881, Tarenetsky²¹ noted that certain diseases were most frequent with definite lengths of intestine, and two years ago Stern²⁰, for example, mentioned a considerable list of diseases which he found associated with the asthenic (carnivorous) and the sthenic (herbivorous) types; anyone who takes the trouble

can find a vast array of disconnected data bearing on the subject, which was written between these dates, and much more has appeared since 1914.

Dr. Hooton's second fundamental misconception is due to apparent ignorance of the existence of this cumulative mass of evidence, especially as it concerns two very vital phases of bodily activity in the living. I refer to the intestinal tract, and to the group of so-called ductless glands. The complaint is made that I have offered "no statistics proving a correlation between short intestines, high stature, and bodily thinness." In two of my previous papers may be found not only data from my own work,⁴ but, in the form of a bibliography⁵ of some five hundred titles, a small fragment of the evidence sought. A larger fragment has been easily collected in the form of a card index which already contains over 6,000 titles bearing upon various aspects of the problem. Familiarity with the activities and interactivities of the ductless glands is almost a *sine qua non* for the study of type, or for that matter, any other phase of modern medicine. Leaving entirely out of consideration my own work, Dr. Hooton can find by turning to only three^{3, 8, 18} of the many books upon this subject, at least 3,000 references of considerable interest. Were he better acquainted with this information, he might perhaps be less dogmatic in denying a possible correlation between type and sex. To put the value of studying medical literature in a nutshell, the following sentences from the introduction of one of the three books just referred to are quoted: "The present unsatisfactory condition of medicine is due to the fact that investigators do not avail themselves of the enormous array of solid data available, to ascertain the truth. Blinded by the fallacious idea that the worth of a contribution to our knowledge should be gauged solely by the new experiments and clinical observations it adds to those already available, they lose sight of the fact that such experiments and observations are but bricks and mortar out of which a coherent and truly useful medicine—one indeed worthy of ranking as a science—can be built."¹⁸

In addition to referring to preparation through study of the literature, it seems necessary to refer to the clinical and other preparation upon which is based the theorem of type. First, vacation and other travels have given opportunity for observation of the following peoples in their own lands: The Nascaupée Indians and Esquimaux of northern Labrador, the natives of Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island, Canadians east of Montreal, Americans from Eastport, Maine, to Washington, D. C., and from New York to San Francisco, the Irish, Welsh, and English, the French, Swiss and Italians, the Dutch and the Danes, the Germans, Austrians and Hungarians, the Egyptians and Arabs, na-

* Plutarch records the following as Caesar's original words: "..... As for those fat men and smooth-combed heads, I never reckon of them; but these pale-visaged and carrion lean people, I fear them most....." Shakespeare (Julius Caesar, Act I), in his later and more polite paraphrase of Plutarch has given a vivid description of the contrasting types.

tives of Ceylon, the Malay states and Java, of China and Japan and of Hawaii. This assortment of peoples is doubtless limited, but it contains representatives from the East and the West, and from the equator well northward toward the land of perpetual snow. Secondly, five years of study have led to present medical conclusions. Many of the larger clinical centres in this country and Europe have been visited, and during two years passed in Europe, particular attention was paid to post mortem work. A total of some 500 sections were examined, varying in age from the foetus of 12 cm. to the adult of 90 years or over. In addition, it has been a privilege to have obtained direct information of great value from many of the foremost clinicians on both sides of the Atlantic. Regardless of other possible criticism, therefore, it can hardly be maintained that the theory of type has been presented hastily and without due consideration.

For the sake of brevity, in direct reply to Dr. Hooton, reference will be made to his article according to the serial number of its paragraphs.

I. One can come nearer to a diagnosis than might be imagined, by inspection and elimination.

II. "Granted that there are tall men and short men, lean men and fat men, and that if we divide men on the basis of these two dimensions it will be found that the short, fat men are more liable to apoplexy, and the tall, lanky men to pulmonary diseases." To admit this is in itself to go almost the whole distance in admitting the existence of type.

It is utterly absurd to state that the classification is "based on one or two anatomical characters." The disputed classification itself contains several pages of differences between the types.

III. The establishment of an "anthropological type" had not occurred to me, but at least one anthropological worker¹ has for the past ten years been attempting to prove that one can recognize such types, regardless of race.

IV. It is certain that Dr. Hooton's anthropological method would smother any attempt to prove the types, but it is already admitted that "short, fat men" and "tall, lanky men" are liable to different diseases. It is inconsistent to start a proof with figures on the "Belgians" and to continue it on the "Europeans," but even these mixed figures admit that after ten years of age women are consistently heavier for height than men. This also supports the relation of type and sex. Why? because, for example, the general statement that fatness and hypothyroidism, thinness and hyperthyroidism are concomitant, finds ample support in the literature.

V. Humanity in the mass does change its type, to a certain extent, during life. But at given ages it will be found that different individuals change to different degrees. Puberty,

for example, comes earlier in the carnivore than in the herbivore, regardless of race or distance from the equator. I certainly have not left out of my "calculations the changes in body form due to age." It is altogether too elementary and obvious a proposition. Likewise, it is very definitely known "to what extent the length of the gut may vary in its absolute and relative size during the lifetime of the individual." Plenty of references will be found in the bibliography⁵ above mentioned.

VI. It is difficult to see why "the illustration of the Indians is particularly unfortunate," unless Dr. Hooton has in mind barnyard or reservation Indians. In former, and for them better days, the braves had no time to wait on the warpath or upon the hunt for corn to grow. The squaws grew the corn at home and did the heavy chores, while the braves covered the country on the run and subsisted upon the game they could kill. The men had to be long and thin or they couldn't stand the pace. In northern Labrador dwell a small remnant of original Americans who yet subsist by hunting, to whom bread and salt are strange, and who depend not upon firearms but upon the spear for killing caribou and upon the wooden hook for catching fish. They live on the country or cease to live at all. This is the variety of the Indian to which I referred, and their outward characteristics as to contrast in body form of the sexes are those represented 25,000 years ago by the artists of the cave-dwellers. It is interesting to remember in this connection that it is only a step from the ideal of female beauty of the prehistoric cave man to the present-day ideal of beauty of the Circassian, whose recumbent Venus must be possessed of sufficient adiposity to make possible the containment of at least an ounce of oil in the umbilicus.

VIII. Figures for races befog the issue. They are of no value for present purposes.

XI. Pigmentation often is excessive in the carnivore. But it is usually of pathologic origin, due often to intestinal conditions which prevent proper excretion and the retention of toxic waste products in the organism. Normal pigmentation is a different matter and perhaps largely a matter of racial characteristics aside from the present issue.

XII. "Of course there may be many individuals with the physical and physiological characters described." It is admitted, then, that type may exist. I never asserted that it was a racial or ethnic affair. Obviously it is not, but the two types occur in almost every race.

XIII. Prominent cheekbones certainly are correlated in the living with a narrow face, close-set eyes, and an aquiline nose. This has nothing to do with skeletal arrangements, but is dependent upon the fact that the face is typically "lean and hungry" looking. The nearest example at hand, of this fact, is an illustration in the Sun-

day paper.¹⁰ Allen of Alaska has just delivered to Capt. Haas of the French army a shipment of his Alaskan dogs. Racially different, the similarity of contour of these two keen faces is striking. To this same type belong Wilbur Wright and Marconi, Lincoln, Emerson, Gladstone and Voltaire, the present rulers of Spain, Serbia, Montenegro, Bulgaria, Germany, Denmark, Sweden, Norway, England and Russia, the Duke of the Abruzzi, Garibaldi, Michael Angelo, Leonardo de Vinci, and many other celebrities who have lived before and after Julius Caesar, not to mention Vesalius, Tuffier, Garré and other well-known medical men. The few chieftains whom I have seen among the northern Labrador Esquimaux are as different in appearance from the others of their tribe as is the Mikado from his peasants. These chiefs are almost a head taller than their people, and their faces are thin, with finely chiselled features. The ordinary modern Esquimaux is a sedentary and lazy individual who will not work when he can avoid it; he is very fond of blubber, which is fattening, and one of his greatest delicacies, according to Dr. John Little¹⁴, is the partly digested moss from the stomach of freshly killed caribou.

XIV. "Microcephaly is certainly rare and generally implies idiocy. Microcephalic idiots are generally far below normal stature." Entirely correct. The only ones I have seen have been idiots in insane asylums, but most of them seemed to be of carnivorous type despite their small stature, which, as previously stated, means nothing definite in regard to type. The carnivorous type is commonly tall, but may occur in miniature at almost any height.

XVII. Bean² has been devoting some time to writings which tend to prove that type and ears do correspond. His hyper- and meso-ontomorph types are my carnivores and herbivores. It is also my observation that there is a certain correlation between type and the form of the ear.

XVIII. "Hypertrophic arthritis" is known to be very frequent on the bones of all ancient races. They were, aside from disease, more liable than moderns to trauma of all sorts. In the living, this nomenclature is reserved for a somewhat definite clinical entity.

XIX. Is there then no difference between "goitre" and "exophthalmic goitre"? It is well understood that men wishing to avoid military service in the region mentioned, drink the waters of known localities for a month or two, acquire a goitre, get their release from duty, cease drinking the given water, and within two months more have recovered their previous state of health. They would scarcely be so casual were they to face the danger of acquiring the exophthalmic variety of goitre.

XXIV. Of course the carnivorous type is not increasing in Europe. The Roundheads remained in England. The Puritans left for America, and the carnivores have been leaving

England ever since. They prefer a new country where restrictions are fewer, and freedom and opportunity are more abundant. Figures are given in this article to show that the carnivore does predominate in this commonwealth.

XXVI. My remark concerning latitude and diet is obviously a generalization, and therefore open to exceptions, but it is believed that in general it does hold true. Cannibalism is now frowned upon. It was once pretty frequent, and even now one may read well authenticated accounts of shipwrecks or disasters from which the survivors escaped by virtue of subsisting on those who were less fitted to withstand the exposure than themselves. Certain primitive tribes still enjoy the odor and taste of human flesh. It is not impossible that boiling victims in oil and the burning alive of martyrs, witches and others, may be an atavistic expression of cannibalism. In short, a desire for meat seems universal to man, but, on account of various obstacles, the majority of the billion or more inhabitants of this earth have to do without it, much of the time. The desire for fats and carbohydrates is also universal, though also varying in practice with local conditions. Thus different races have their own specialties in the way of fats and oils. As for carbohydrates, even the Nascaupsee Indian, essentially a pure carnivore, when starting out for a day's hunt, takes as sustenance only a cup of water into which he stirs a handful of "uinastikai." This substance is prepared chiefly from caribou blood, and the partly digested moss from the stomach of the caribou. In this connection, Cabot³ says, "It is probable that the slightly digested moss which enters into the uinastikai appeals to our natural desire, seldom gratified in the northern life, for starchy food."

XXVII. Granted that some meat eaters do exist near the equator, even then it has no effect on the general theory of type. But in his attempt to prove the contrary, Dr. Hooton has provided a beautiful example of correlation between diet and type. The efficacy of the tropical jungle may have some local effect in varying the intensity of the action of the sun, but in this case it is, at least, a matter of very secondary importance. One need not look beyond the diet for an explanation of the fact that "the full-grown Masai of pure blood is generally six feet in height at the age of 16, though at that time he is often a spindly and cumbersome and ungraceful hobbledohy. Three years, however, of an exclusive diet of milk, blood, and half-raw beef-steaks, combined with a rigorous training in warlike and athletic exercises, have developed him into a sinewy and muscular man." This is precisely what is to be expected of such a diet.

XXVIII. It is a pleasure to express my gratitude to Dr. Hooton for his calling attention to two misprints and one error in arrangement, existing in a paragraph containing the reference to Treves, which he quotes. "Animals" should read "Mammals," "Insects" should read "In-

sectivora;" the passage^{2a} should read: "through the insectivora and cheiroptera to the monotremes." Treves only infers that perhaps the amphibians come below the monotremes, so all reference to the amphibians is best omitted. With these corrections, the passage is again presented. I did not originate it. It has been available for thirty years, and complaints should be made to its originator. If it is incorrect, there has certainly been time for revision. In this connection, it is sincerely to be hoped that the general theory of type, and in particular the provisional classification, will be subjected to further criticism. Although it is believed that the general theory will stand, it is entirely probable that details must be revised. Any valid corrections offered will be accepted with thanks, and acknowledged with gratitude.

XXIX. It is to be deplored that Dr. Hooton should draw such a peculiar inference. It certainly had not occurred to me.

XXX. Dr. Hooton would be conferring a favor if he would state his "other reasons" why he "cannot believe in the existence of" the carnivorous and herbivorous types of man. As has been previously remarked, his anthropologic method would certainly never reveal the existence of type even if there were a doubt of its existence, which, fortunately, there is not. One word of caution is necessary. In working with type, it is difficult to do much in infancy or before five to seven years of age. Internally, intestinal and ductless glandular variations may be demonstrated even early in the foetus, but outwardly, all infants have much the same body form.

In conclusion, it may be stated that Dr. Hooton's objections do not appear to be sufficient to overthrow the theory of type which has been presented. To reverse his parting words: I think I do not go too far when I say I feel assured that if students preparing for an anthropological course were thoroughly grounded in medicine, it would very greatly enlarge their field of vision in their later professional career, and that such a preliminary training would result not only in invaluable contributions to medicine by members of the anthropological profession, but would also be instrumental in the advancement of medical science.

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CONCERNING THE RAISON D'ÊTRE OF THE TERM "INVOLUTIONAL" AS APPLIED TO MELANCHOLIA.*

By J. W. COURTNEY, M.D., BOSTON.

THERE is probably no easier way out of the subtle and complex problem of causation in mental disorders than to ascribe to certain epochs in human life,—puberty, adolescence and the climacteric, for example—consequent organic upheavals in circulation, in ductless glands or in any other component part of the economy to which fancy may lead the attention of the individual observer, to make these upheavals responsible for whatever mental aberrations may occur in the given epoch and to attach to these aberrations names suggested by the epoch. Such a procedure may, superficially at least, satisfy the demand for differentiation which obtains in clinical psychiatry. But is it ever warranted by close observation of clinical and pathologic facts?

A complete answer to this comprehensive question the writer will not venture to attempt, but will confine himself strictly to the case of so-called involutional melancholia and endeavor to set forth valid reasons for believing, as he does, that the term is purely one of convenience and one without the slightest *raison d'être* from a descriptive, a pathologic or a differential standpoint.

According to the well-known views of Kraepelin, melancholia occupies the foremost place in, and is the most typical of, the group of psychoses which he believes to stand in direct causal relationship to *general* involutional changes. Furthermore, he extends it to embrace all pathologic anxiety-depressions of the last half of life, which do not represent episodes in other forms of mental disease.

According to the same observer, the age of onset varies between forty and sixty-five years, and the incidence of the disorder, as regards sex, is 60% among women as against 50% among men. It is also his idea that melancholia probably represents a pathologically intensified expression of the growing feeling of incapacity and inefficiency natural to advanced years as opposed to the consciousness of superabundant vigor which obtains in youth.

The excuse for exploiting these Kraepelinian views, familiar to you all, is that they furnish an integral part of the basis of the argument to follow. First of all, it is difficult for the writer

* Paper read before the Boston Society of Psychiatry and Neurology, October 21, 1915.

to bring into harmony with logic the notion that melancholia stands in intimate causal relationship with general involutional changes in the organism. It is to him absolutely inconceivable that, in the absence of all other causes, the state of organic involution which normally obtains at the age of forty is capable of producing a mental disorder in nowise distinguishable clinically from that produced by the same agent at the age of sixty-five. In the case of women it might be argued that the climacteric, commonly alleged as a causative factor of tremendous moment, outweighs in involutional importance anything indicative of natural organic decadence in the sixth decade. But there is more than one insuperable objection to such argument. First, that the number of female melancholics exceeds that of male by only 10%; second, that in many cases melancholia makes its appearance either several years before or many years after climacteric changes begin to manifest themselves; and third, that both pregnancy and lactation are not so very infrequently accompanied by a complex of morbid mental symptoms in no essential respects different from that which is supposed to be pathognomonic of the mental disorder under consideration. Here, also, two other facts irreconcilable with the Kraepelin theory are not out of place. One is to the effect that melancholia is recoverable, both at forty and sixty-five under forms of treatment which do not at all possess the specific property of arresting involutional changes; the other brings us face to face with a state of affairs that transcends the merely paradoxical—namely, that many cases of irrecoverable *involutional* melancholia terminate in a mental state indistinguishable from that which we are pleased to consider the product of disordered evolution and which we call *dementia precoc.*

No one who surveys critically the field of mental disorders can possibly fail to appreciate the fact that while there are striking differences among these disorders with respect to duration, termination and, possibly, also pathology, there are too many clinical expressions of prime importance common to all to permit of the conclusion that such a state of affairs is merely fortuitous. If we give any heed at all to the law of cause and effect we must at once admit that identity of effect signifies identity of cause, and this single fact should restrain us from attempting too sharp differentiations in clinical psychiatry.

It is interesting to note that the same situation obtains as regards causation in disorders of the body politic, and we might with profit apply in our appreciation of mental disturbances the wisdom contained in the following words of Montesquieu regarding disorders of state. "There are," he says, "general causes, moral and physical, which act in each state, elevate it, maintain it, or cast it down; every accident is submitted to these causes, and if the fortune of a battle, that is to say a particular cause, has ruined a

state, there was a general cause which brought it about that that state had to perish by a single battle."

To the present writer's way of thinking, the above utterances have a peculiar applicability, particularly with respect to the matter of general causes, in so-called involutional melancholia. And in this category heredity seems logically to hold the foremost place. Kraepelin states, on the contrary, that the causal importance of heredity is quite insignificant as compared with acquired disposition, and bases this statement on the fact that in only 53% of his patients whose antecedents could be accurately determined did he find any evidence—and that often remote—of a family predisposition to the disorder under consideration. He admits, however, that the difficulties in obtaining exact information concerning parents and the brothers and sisters of the same were, in the older patients particularly, manifold.

These difficulties are keenly appreciated by all of us. In very many cases we feel morally certain that the fact of the existence of insanity in the patient's forebears—whether immediate or remote—is intentionally concealed from us by his near relatives. In many others no reliable information is obtainable on this point, even where no attempt is made by those concerned to obscure the truth. I personally feel that if the whole truth could be known, it would at once appear that practically every victim of involutional melancholia is the possessor of the insane diathesis. Be this as it may, the fact that Kraepelin finds some evidence of ancestral insanity in more than half of his melancholics serves notably in making heredity share with involution the burden of causative responsibility.

The importance of establishing heredity as a strong causal factor becomes manifest when we examine Kraepelin's notion concerning the pathology of involutional melancholia as expressed in his statement, already quoted, to the effect that it probably represents a pathologically intensified expression of the constantly growing feeling of incapacity and inefficiency natural to advanced years—in other words, that the disorder is a dynamic one. This conception immediately puts the involutional melancholic in the same category with the neurasthenic, the psychasthenic and the hysteric, whose fundamental disorder is a dynamic one and one, furthermore, mainly of congenital origin.

It now remains to be shown that the assignment of melancholia to the same pathologic class with neurasthenia, psychasthenia and hysteria is not a purely arbitrary one. Nobody will deny that the symptomatology of all three of the disorders just mentioned is strikingly identical in the bulk of its major aspects. Now, if we continue the process of comparison and range the symptoms of psychasthenia with those of involutional melancholia, we find on careful analysis that melancholia is nothing more than psychas-

themia with the barriers of inhibition swept away.

The melancholic's delusions represent nothing more than an intensification of the psychasthenic's obsessions of sacrilege, of crime, of disease, of shame of self and shame of the body; the phobias of both—the most characteristic expression of the adynamic state to be found in symptomatology—are absolutely identical, both in kind and degree; their crises of agitation and anxiety show no noteworthy points of dissimilarity; their ties, their *folies du doute* are the same; the same manias of oscillation, interrogation and omens are found in both,—indeed, this symptomatic parallelism might be extended to the point of wearisomeness. Whatever differences there may exist in symptoms are differences in intensity only. For further examples,—the psychasthenic, actuated by feelings of remorse, shame of self or of the body, desire for expiation or reparation, general sense of unworthiness or what not, has impulses toward self-mutilation or self-destruction, which are never fulfilled, while the melancholic, actuated by motives identical in kind, but of sufficient intensity to annihilate inhibition, really maims or destroys himself. A final and even more striking illustration of the point under consideration is furnished by the feeling of strangeness and depersonalization. It is experienced by the psychasthenic and the melancholic alike, but whereas the former, by constant argumentation succeeds in convincing himself that it is *his* hand with which he performs certain movements, *his* feet which carry him about, *his* voice with which he speaks, the melancholic falls, by the intensity of the above morbid feeling and by the consequent complete loss of inhibition, under the domination of the delusion that the various members of his body are not actually his, that they are not real living parts, that he is, in fact, non-existent; and he finally carries his notions of nihilism to the point where they embrace all the phenomena of the universe.

The query now arises: Are involuntional processes the factor responsible for the intensification of morbid feelings which transforms psychasthenia into melancholia?

That the answer must be in the negative is determined by several facts, two of which are most conclusive: The first comes from the march of events in certain cases in adolescents where the symptom-complex is at the outset that of psychasthenia and the terminal stage a dementia, called *precox*, which has no demonstrable connection with general involuntional processes, yet is indistinguishable from one terminal stage of the disease designated, under present usage, as involuntional melancholia; the second is drawn from the observation of depressed states identical with so-called involuntional melancholia, which make their appearance during the flood-tide of mental and physical vigor, run their course and recover, and which may even recur

and again recover several times over before involuntional processes in the economy have fairly started.

On the strength of all the facts adduced, the writer ventures to contend that the term *involuntional* not only adds nothing to our understanding of the disease melancholia, but that it is positively misleading from the standpoint of pathology—hence, should be discarded.

BACTERIOLOGICAL WORK AT THE AMERICAN AMBULANCE.*

BY ORVILLE F. ROGERS, JR., M.D., BOSTON.

AND

GEORGE BENET, M.D., BOSTON.

THE following report is based upon the bacteriological work which was done as a part of the Harvard University Service of the American Ambulance, from April 1 to July 1, 1915.

There was an excellent general pathological and bacteriological service organized and well equipped, as one of the sub-departments of the institution, under Dr. Joblons, when the Harvard Service came on duty, April 1, 1915. After Dr. Joblons' resignation in April, Dr. Kenneth Taylor took charge of the general pathological work, and the writers would here express to these two gentlemen their gratitude and appreciation for the assistance they gave to the Harvard Service in the equipment of its own laboratory, and in the institution of its special work.

Owing to the departure of Dr. Richard P. Strong for Serbia, the Harvard Unit lost the benefit of his continued direction and counsel. The bacteriological work, however, was carried out as nearly as possible in accordance with the plans laid down by him. The work which is here described was outlined by Dr. Strong before his departure for Serbia, but it was a great loss to us that he was unable to remain in Paris and direct it.

Our purpose was to determine, if possible, whether there was more than one strain of gas bacillus causing gas gangrene, and, if so, to study the growth of these bacilli in various sugar media, and try to differentiate them by this means. In addition, we were interested in the relation of the gas infection to the type of missile which had caused the wound, the presence or absence of clinical symptoms, and several other phases of the subject.

Cultures were taken from fresh wounds which showed any discharge. Many of our admissions had no discharge, some were overlooked, and others arrived before the laboratory was fitted for work, with the result that we obtained cultures from 100 different men. One hundred and thirty-two different cultures were taken on these

* Read at a meeting of the Boston Surgical Society on Nov. 1, 1915.

Number.		Plain Agar.	Glucose Agar.	Lactose Agar.	Lactulose Agar.	Maltose Agar.	Mannite Agar.	Inulin Agar.	Nitrate and Glucose Agar.	Morphology and Gram Stain.
1529	Gas	4	4	3	5	3	0	5	3	Large Gram pos. and neg. rods, blunt ends.
	Growth	—	—	—	—	—	3	—	—	
1321	Gas	3	3	12	5	5	1	3	4	Large blunt ended rods both Gram pos. and neg.
	Growth	4	—	12	5	5	1	3	3	
1675	Gas	2	—	—	0	0	3	0	0	Small Gram neg. thin bacillus, one-half size of anthrax.
	Growth	—	—	—	3	3	—	3	3	
1612	Gas	0	—	1	5	4	1	3	4	Short Gram pos. round ended rods. Few ovoid forms.
	Growth	2	—	3	4	4	1	3	3	
1630	Gas	1	—	3	4	5	1	3	3	Large round ended Gram pos. rods.
	Growth	3	—	5	4	5	3	5	5	
1845	Gas	3	—	2	5	5	2	2	4	
	Growth	4	—	3	5	5	3	5	5	
1717	Gas	3	—	2	5	5	2	3	5	
	Growth	5	—	3	5	5	3	5	5	
1016	Gas	2	—	2	1	4	1	1	3	Gram pos. blunt ended rods, size of anthrax.
	Growth	2	—	4	1	5	3	3	5	
1011	Gas	0	—	1	4	4	1	—	3	
	Growth	1	—	4	5	5	3	—	5	
1080	Gas	0	4	0	1	1	4	3	3	
	Growth	1	5	3	3	3	5	3	3	
932	Gas	0	4	0	4	4	1	1	3	
	Growth	1	4	1	5	5	2	3	5	
2019	Gas	2	4	2	3	4	0	0	3	Large Gram pos. bacilli, size of anthrax.
	Growth	1	5	2	5	5	1	1	5	
1071	Gas	1	3	3	1	0	3	3	2	Large square ended Gram pos. bacilli, often in pairs.
	Growth	3	3	5	3	3	5	5	3	
2105	Gas	3	3	1	3	5	3	2	3	Same as 1071, both showing often irregular and bipolar staining.
	Growth	5	5	1	5	5	5	5	5	
Bx.	Gas	2	2	1	—	5	1	2	4	Short, Gram pos. rods with rounded ends, often in short chains.
	Growth	2	3	2	—	4	2	3	4	
2214	Gas	1	5	2	—	3	0	2	5	Rather slender, long bacilli with rounded ends, often in pairs, Gram pos.
	Growth	3	4	2	—	4	2	3	5	
2196	Gas	1	4	0	—	4	1	3	2	Moderate sized, round ended rods, Gram pos., with many central spores.
	Growth	3	4	0	—	4	3	4	3	
1888	Gas	0	4	2	—	4	0	2	3	Moderately long, Gram pos. rods. Spores at ends or middle.
	Growth	3	4	2	—	4	2	3	3	
Aver-	Gas	1.5	3.6	1.6	3.3	3.6	1.4	2.2	3.2	
ages	Growth	2.7	4.1	2.6	4.1	4.4	2.6	3.6	4.1	

cases, as some had multiple injuries and others had cultures repeated. A few cultures of clothing were taken, but that phase of the work was mainly in the hands of another worker, as were the animal experiments, with these organisms.

Our method of procedure, as outlined by Dr. Strong, was as follows: Cultures were taken from the patient on admission, on sterile cotton swabs, and inoculations made in plain bouillon. From this medium re-inoculations were made in

plain agar stabs and slants, and glucose agar stabs. Agar plates were made also in some of the cases. The original bouillon culture was then heated to 60 or 70° C. for thirty minutes or more, to kill non-spore-bearing organisms, and re-inoculations made in glucose agar stabs. After twenty-four hours' incubation the growths were examined, and the attempt made to isolate the colonies from such cultures as showed gas production. Rarely pure cultures

were obtained at this stage, but usually it required repeated plating and re-inoculations to accomplish this. When the cultures were obtained pure they were grown anaerobically, by means of pyrogallie acid, on a glucose agar slant, and further inoculations made from this growth. We used the following media: Plain bouillon, glucose bouillon, bouillon Martin, egg bouillon, peptone solution, litmus milk and agar, gelatine, plain agar, and agar to which had been added one of the following sugars: Glucose, lactose, levulose, maltose, mannite, and inulin; also glucose and nitrate media, and potato. These were incubated twenty-four to forty-eight hours and the results recorded. Staining reactions, morphology, motility, etc., were noted.

Of the 100 different men, the cultures from 28 showed gas-producing organisms. However, for one reason or another, we were able to obtain pure cultures of only 18 different organisms to run through the various sugar media.

The amount of growth and gas production was recorded by numbers. The numeral "1" indicated, for example, very slight; "5," very large gas production, with the intermediate numerals for amounts between these extremes. A table was made, using these figures, and the average values of gas production computed for each sugar medium by adding the numbers set down for any one sugar, and dividing by the number of organisms. These average values were then compared with the figures for the individual organisms, and although we had several different strains, we could find no greater variations from the average among these strains than among different individuals of the same strain. The results seemed to show that it is the type of sugar, and not the strain of organism, which dictates the amount of gas production. In short, from our work with the sugar media it appears that they are not suitable as a means of identification or differentiation of the gas-producing bacilli.

While 28 of the men whose wounds were cultured showed the presence of gas bacillus, only 9 of these had any clinical signs of a gas infection, and in 7 of these latter cases there was only slight subcutaneous crepitation, or a few bubbles of gas in the pus, signs which disappeared at once on wide incision. Of the 2 patients who had severe symptoms, one had a very bad gas infection of the leg, and one died of gas bacillus septicemia, following infection of the arm. Both of these cases were clinically developed on arrival at the hospital, and in no instance did a positive culture foretell subsequent trouble from gas infection.

The majority of cultures showed staphylococcus, either alone (30), or with other organisms (58). Forty cultures showed an anaerobic growth of other than gas producers. Other organisms seen were: pneumococcus (11), streptococcus (9), pyocyanus (5), and varieties of anaerobes other than gas producers (25).

What effect the presence of fragments of cloth

or shell in the wound had in relation to the finding of gas bacilli in the cultures, was an interesting question. Out of 7 cases in which cultures were made from the cloth picked from the wounds at operation, 4 showed the presence of gas bacilli, while 3 were negative. In 2 of the positive cases, the pus from the wounds did not show gas organisms.

The type of missile seemed important, for of the 28 cases positive for gas bacilli, the wound was caused by shell fragments in 17, or 61%; by rifle bullet in 7, or 25%; by shrapnel in 3, or 11%; and by mitraille in 1, or 3%. When this is compared with the figures for the total cases, we find that fragments caused only 42% of all the wounds, as against 61% of the gas infections; and rifle bullets 40% of the wounds, and only 25% of the infections. Shrapnel caused 10% of the wounds, and 11% of the infections. The striking thing, then, is the much greater liability of a shell fragment to cause gas infection as compared with a rifle bullet, undoubtedly due to the fact that it is more likely to carry cloth and dirt with it than is the rifle bullet.

The men whose cultures showed gas bacilli averaged to have the same treatment as those who did not. It is not possible to say, either, that the men who showed severe clinical symptoms had any poorer treatment immediately after injury than many who had no symptoms at all.

The question of the utility of baths and recent changes of underclothes as preventatives of gas infections seems to be answered in the negative. The nature of the warfare is such that the uniform is always dirty, and it is from this dirt, undoubtedly, that the infection comes—not from the linen or skin.

The regions vary somewhat as to the prevalence of gas infection in the wounds. This regional difference is shown by the fact that out of 17 cultures from patients from the Ypres region, only 2 showed gas bacilli (12%), while out of 41 from men from Arras, and nearby points, there were 19 positive cultures (46%).

We could form no idea of seasonal changes, for we were there but a short while, and the increase in positive cultures during June may have been due to the increased activity around Arras at that time.

SPINA-BIFIDA.

BY BENJAMIN B. CATES, M.D., KNOXVILLE, TENN.

ON September 26, 1907, I read a paper on Spina-Bifida before the East Tennessee Medical Society in Knoxville, Tennessee, reporting three cases of spina-bifida, which were operated. This paper was published in the BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clviii, No. 5, pp. 154-157, Jan. 30, 1908.

On April 11, 1911, I read another paper on Spina-Bifida before the Tennessee Medical Society at Nashville, Tennessee, reporting four additional cases of spina-bifida. This paper appeared in the *BOSTON MEDICAL AND SURGICAL JOURNAL*, Vol. clxv, No. 1, pp. 13-15, July 6, 1911.

Since these papers were published, I have operated nine other cases of spina-bifida, which I wish to sketch in this paper as a supplement to the other two papers already reported. I shall not attempt to elaborate on what has gone before (further than to correct a mistake I made in reporting the age of patient No. 7 in the second paper. The report gives the age as 26 years, when it should read 34 years), but content myself with a serial continuation of my papers one and two on Spina-Bifida, reporting the cases serially.

CASE 8. Baby S., age, 2 months. Female, white. Referred by Dr. J. M. Cox, Scarboro, Tennessee.

Family History. Father and mother healthy.

Personal History. Was born with a cervical tumor just below the occipital bone. This tumor grew rapidly and at time of operation was size of a hen's egg.

Diagnosis. Meningocele (cervical).

Treatment. March 28, 1912, removed tumor at operation.

Immediate result. Good.

Late result. Baby S. lived and thrived until the following December, when she died of pneumonia.

CASE 9. Baby Y, age, 21 days. Female, white. Referred by Dr. J. Q. A. West, Knoxville, Tennessee.

Family History. Father and mother healthy.

Personal History. Born with a tumor in lumbar region, has paralysis of lower limbs, otherwise normal.

Diagnosis. Meningo-myelocoele (interrupta), latter diagnosis made at operation.

Treatment. June 3, 1912. Excised tumor which had two pedicles, which came out of interrupted spinal canal, that is to say, there was a defect of the second lumbar vertebra from which protruded the upper pedicle, then intact third lumbar vertebra, with absence of arch of fourth lumbar vertebra, from which protruded the lower pedicle. Both pedicles were inside a common sac, which, from external appearances, gave no indication of the conditions found at operation.

I removed the sac, replaced nerve elements in the canal, and covered over the defect with fascia turned over from muscles on either side of the defect. The entire posterior osseous part of the sacral canal was absent, but was covered with dense fascia. This I did not disturb.

Result. Baby Y recovered from the operation, the wound healed by first intention, but in one week its head began to enlarge.

July 23, 1912. Has well-developed hydrocephalus and internal strabismus—no motion in lower limbs.

Subsequent History. The parents removed to California with the child, where the child lived without improvement for four or five months and died.

CASE 10. H. R., age 12 years. Male, white. Referred by Dr. C. C. DeArmond, Knoxville, Tennessee.

Family History. Father and mother and one sister living and in good health.

Personal History. Slender, anaemic boy, with rather large head, was born with a tumor over lumbosacral region. This tumor grew and became as large as a coconut. Four or five weeks before I saw him the sac broke and began discharging cerebro-spinal fluid. It became infected and suppurated three or four weeks. The suppurated seemed to be between the sac proper and the overlying skin, so I made a free incision through the skin and packed loosely each day. The wound granulated and cicatrized.

June 14, 1912, I removed the tumor, turned in nerve fibres, and covered over the defect (which was 2 inches long and 1 inch wide) with fascia from the erector spinal muscles. The patient rallied from the operation all right, but part of the wound became infected and had to heal by granulation.

For six days the patient lost control of bowels, with anesthesia of buttocks, and inner and back part of upper 1/3 of thighs. A few days after the operation, an eruption appeared on the hands, resembling very much pellagra. For six weeks he could not void urine and had to be catheterized. This set up a cystitis which bothered him for a long time. Now at the present writing (Jan. 1, 1916), he has trouble in controlling his bladder, as the urine dribbles away.

CASE 11. Baby McN., age, 6 weeks. Female, white. Referred by Dr. Eva Newell, Knoxville, Tennessee.

Family History. First-born of healthy parents.

Personal History. Has tumor over lower lumbar and upper sacral region, the size of a hen's egg.

Diagnosis. Meningocele.

Treatment. March 29, 1913, removed tumor by operation and covered over defect with fascia from neighboring muscles.

Immediate Result. Good, no complications.

Remote Result. Dec. 14, 1915, I saw Baby McN. She is a bright, chubby little girl full of life, talking and walking everywhere. The site of operation is covered with long hair.

CASE 12. Baby N., age, 41 days. Male, white. Referred by Dr. J. D. Herrell, Powells, Tennessee.

Family History. First-born of healthy parents.

Personal History. Has tumor size of hen's egg in mid-sacral region, also umbilical hernia, otherwise a normal healthy child.

Diagnosis. Meningo-myelocoele.

Treatment. April 9, 1913, removed tumor and covered in defect one inch long and one-half inch wide with fascia.

Result. Good.

Present Status. Dec. 15, 1915, good.

CASE 13. Baby D. H., age, 2 months. Female, white. Referred by Dr. J. G. Eblen of Lenoir City, Tennessee.

Family History. Father and mother, one brother and one sister all healthy.

Present History. Born with a tumor in upper cervical region. Tumor was smooth, translucent and glistening over dome.

Diagnosis. Cervical meningocele, operation showed it to be a suboccipital meningocele.

Treatment. June 27, 1913, removed tumor (which had a long pedicle) by operation. The pedicle protruded through a defective development on the posterior border of the foramen magnum. The long stalk to the pedicle allowed the tumor to gravitate into the neck and appear as if there was a defect in one of the cervical vertebrae, when in truth it protruded through the foramen magnum which extended upon the occipital bone for about 1/2 inch.

The pedicle was cut off, sewed with cat gut and the defect covered with fascia from either side. The skin was closed with horse hair.

Result. I went to another town to do the operation and as I never saw the child again, I shall append verbatim without comment Dr. Eblin's (the family physician) report made at my request.

"This child was born April 5, 1913, was operated on June 27, 1913, and died Sept. 2, 1913. The wound after the operation healed by first intention and no evidence of infection. Thirteen days after the operation, a bad train of symptoms developed and lasted until it died.

"The symptoms were about as follows: Temperature running up to 105° in the afternoon, and then it would become normal or almost so in less than 24 hours, and later return again.

"It would draw at times in the muscles of the back and arms, and back of the neck. It vomited frequently and there seemed to be general disturbance of the alimentary canal which I could not correct with diet or medicine."

CASE 14. Baby P., age 4 months. Female, white. Referred by Drs. Penland of Philadelphia, Tennessee, and George of Rockwood, Tennessee.

Family History. Born of healthy parents with a sessile tumor at junction of middle and lower thirds of spine. The tumor was translucent and membranous except at centre which showed a corrugated surface of skin the size of a five-cent piece.

Diagnosis. Meningo-myelocele.

Treatment. Oct. 1, 1913, the tumor was removed by operation. The interior of the sac was plastered all over with nerve fibres which converged to the under surface of button of skin at the dome of the sac. The posterior arches of all the lumbar and lower two dorsal vertebrae were lacking.

I peeled off all the nerve elements from the interior of the sac as far as the button of skin. It seemed impossible to separate the nerve fibres at this point without destroying them, so I shaved off the button of skin down to the sac, turned the mass into the shallow canal, tied off the sac and covered defect and all nerve elements with fascia taken from the erector spinal muscles on either side and turned over, like a trap door.

Result. The baby did finely until the evening of the fifth day, when, without warning, it began having convulsions, and died in convulsions on the following day. Six days after the operation.

CASE 15. Baby M., age, 2 months. Female, white. Referred by Dr. J. L. Proudfoot, Athens, Tennessee.

History. First-born of healthy parents, has large lumbosacral tumor.

Diagnosis. Meningo-myelocele involving all of sacrum and lower two lumbar vertebrae.

Treatment. March 3, 1915, removed tumor. The inner surface of the sac was covered with the cauda equina.

Replaced cord elements in lumbosacral canal and covered canal with fascial flaps taken from the erector spinal muscles and iliac fascia.

Result. Baby recovered from operation and lived 27 days without recovering the use of its lower limbs or controlling its bowels. There was a continuous diarrhea which nothing could control, though at times it seemed as if a few drops of a 2% argyrol given by the mouth several times a day would benefit it for a few hours.

CASE 16. P. W., age 5 years. Female, white. Referred by Dr. J. M. VanderGriff of Halls X Roads, Tennessee.

History. Born of healthy parents with a lumbosacral tumor.

Diagnosis. Meningo-myelocele due to lack of development in lower two lumbar and upper sacral vertebrae.

Treatment. April 22, 1915, removed tumor and covered defect with fascia.

Result. She did well for a few days, when she developed meningitis and died on the eighth day following the operation.

This was an especially sad case and it nearly broke my heart to see her die; because she was so patient and wanted to live so much, and was willing to cooperate in any little orders I would give the nurse.

REMARKS.

It will be seen from a study of the sixteen cases I have operated, that the ages of those afflicted with spina-bifida varied within wide limits. The youngest being twenty-one days and the oldest 34 years. The age of the patient is not such an important factor in determining the personal equation as the physical condition. Most of these patients have low vitality and poor resistance, hence are extra hazardous risks. But a most important point, and one that the surgeon may emphasize, is that at some period of such a patient's life, the sac will rupture either as the result of distention and thinning from over-accumulation of cerebro-spinal fluid, or the result of ulceration from trauma with all the dangers of infection. For that reason the surgeon may with a clear conscience urge the lesser of two evils, operation under the most favorable circumstances, rather than rupture with risk of infection and meningitis.

Of my sixteen cases, ten survived beyond a post operative period of three months. Of these ten there died, one four months, and one eight months P.O. of pneumonia, and one six months P.O. of hydrocephalus; seven are living.

To wit: In the first series after nearly eight years, one patient, a boy, had upper sacral tumor, is healthy and growing.

In the second series, after five years, three are living; of these, two are children, one had cervical tumor, is healthy; the other had lumbar tumor, has hydrocephalus and paralysis of lower limbs and obstinate constipation. The third had lumbosacral tumor, is 39 years old, a big, stout chauffeur, working every day driving a big automobile.

In the third series, one patient, a boy of fifteen, had lumbo-sacral tumor after three and a half years, is growing and doing fairly well except he cannot control his bladder; one a girl had lumbo-sacral tumor, is doing well after twenty-one months. Another, a male child with meningo-myelocele in mid-sacral region, is doing well after twenty months.

NOTES ON THE RECENT EPIDEMIC OF INFLUENZA.

By JOHN A. CECONI, M.D., BOSTON,

Medical Inspector in Division of Communicable Diseases, Boston Health Department.

At the suggestion of the Health Commission of Boston, the following observations are made by the writer (a field worker in the Health Department) in twenty-seven cases of various types occurring in the present epidemic of acute infections of the upper respiratory and gastrointestinal tracts. In the first place, they all came under his own personal observation, and in the second place, the clinical findings in all of these cases were supplemented by a bacteriological study by Dr. George P. Sanborn of the Boston City Hospital, whose results will be embodied in a conjoined report.

Every practitioner of medicine in this community has, of course, been brought in personal relation with many cases similar to those which form the subject matter of this brief study, and it was felt that a statement of the memoranda in these cases, supplemented by the bacteriological findings, might prove interesting, if not instructive, to those whose duties required attendance on such cases.

All of these cases occurred in Greater Boston within the last few weeks, the epidemic apparently reaching here from the Middle West. While it is not believed that the season of the year is in itself directly responsible for these acute respiratory infections, it is generally conceded that the faulty hygiene which obtains during the colder months of the year may well be an indirect etiological factor.

Fifteen of the cases in this series were males; twelve were females. If this permits of any deduction, it will appear that the sex of the patient is of no special significance. Nor would age appear to be respected by the invading organism, since the writer's cases range from fourteen months to forty-six years of age, and numerous cases have been brought to his attention where even those of advanced years have been victims of this epidemic.

The most striking feature of this series of cases was that they had certain characteristics in common. Primarily, the site of infection was in the upper air passages, very often first in

the larynx, trachea and naso-pharynx. For example, 70% of all these cases showed infection in the situations named, and 30% showed gastro-intestinal and respiratory symptoms combined.

The incubation period, as far as could be noted, was very brief, being in many instances less than twelve hours, and in others retarded to seventy-two hours.

The mode of onset in every case of this series was abrupt. There were no symptoms which could be definitely classified as prodromal. All the cases now under discussion were prostrated to a greater or less degree; all were confined to bed, although members of the immediate household, to whom the infection in some cases might be traced, were never acutely ill, were always ambulatory types, and might possibly be considered carriers.

The usual history (70% in this series) was as follows:

The patient taken suddenly ill, found in bed, prostrated, complaining of hoarseness, frequent irritating cough, often paroxysmal in character, accompanied by substernal constriction, marked frontal headache, generalized pain, more pronounced in the legs, and the mental state which might, perhaps, be properly described as one of apprehension.

This initial stage was promptly followed by the appearance of profuse muco-purulent expectoration, which was often greenish yellow, tenacious in character, and was associated with a similar nasal discharge, which might occur in both nostrils, but more commonly in one, suggesting the possibility of sinus involvement.

All of these cases showed fever to a greater or less degree (from 100° F. to 104° F.), being subject to marked fluctuation with remission or exacerbation of symptoms.

Physical examination was very often disappointing to a degree; aside from the perfectly obvious discharges and an unmistakable pharyngitis, physical signs were for the most part wanting. Such was the average case.

These cases remained in bed four to six days, soon relieved of the constitutional symptoms, seldom relieved of the cough, nasal discharge and frontal headache.

During subsequent days, there was in many of the cases of this type, such an amelioration of symptoms as to lead one to believe that the illness had terminated, but a recurrence of the fever, nasal discharge, frontal headache, etc., led one to consider a reinfection.

Some few of these respiratory infections showed an extension of the process to the bronchial tubes with a marked increase in the prostration and, in fact, of all the symptoms.

In no case has the writer been able to determine any definite pneumonic consolidation of the lungs, although one case suggests the beginning of a catarrhal pneumonia at this writing.

Mingled with these usual types were cases (30% in this series) in which the predominating

symptoms were gastro-intestinal. These occurred largely in infants. Such a case would give a history as follows:

That some member of the immediate family had had an infection of the upper air passages for some days, and had come into intimate contact with the child now ill; that the child had shown evidences of infection in the eyes, nose and throat, as in the cases previously outlined, without, however, decided constitutional symptoms over a period covering three or four days; following which, the child became acutely ill with persistent vomiting, intense thirst, and a choleraform diarrhea. The prostration was extreme. The patients were pale, the eyes sunken, the tongue heavily coated; the temperature in most cases was low, in many subnormal. The pulse was slow and compressible.

No definite signs could be made out on examination of the abdomen, but a general condition of hyperesthesia seemed to prevail, as all these children cried on any attempt at handling by an attendant.

The dejecta were liquid, frequent, copious, and foul smelling in all cases; contained mucus in most of the cases, and blood in two of this series.

The urine was scanty, high in color, and acid in reaction in most cases. Forty per cent. showed albumin; one specimen showed the presence of acetone.

Accompanying these gastro-intestinal types, there were skin manifestations, both urticarial and erythematous. These rashes, however, were transient.

The striking features of these types of cases were:

1. Persistent vomiting.
2. Intense thirst.
3. Prostration.
4. Subnormal temperature.
5. Slow, small pulse.
6. Moist skin.
7. Choleraic diarrhea.

Such were the types of cases which prevailed largely during this recent epidemic.

CONCLUSIONS.

That these conditions were due to a specific organism in some cases and to mixed infections in others, seemed so clearly indicated that, as stated in the early part of this paper, bacteriological studies of the cases were made by Dr. Sanborn.

Clinically it would appear to be a highly communicable condition, spread by mild ambulatory carriers, increasing in severity as it progressed, sparing neither age nor sex, protean in some of its minor manifestations and conferring on its victims no immediate immunity, since several cases showed evidences of relapse or reinfection.

PROPHYLAXIS (GENERAL).

During epidemics such as the present, overcrowded places, especially stuffy traffic vehicles, should be avoided. Households in which the infection is known to exist should be shunned. Breathing fresh air is an excellent measure against any infection. Over-study and over-work weaken one's resistance. Therefore, recreation of the body and mind together is commendable, as it tends to develop the constitution, fortifying it against disease.

PROPHYLAXIS (PERSONAL).

1. Those infected should be careful to protect others from bacilli-laden particles of nasal and buccal secretions by the judicious use of their handkerchiefs.

2. The family physician should be immediately called, so that treatment may be instituted and proper isolation established.

THE DESIRE OF THE HEALTH DEPARTMENT.

When a physician meets with a series of cases of acute respiratory affections having any resemblance whatsoever to influenza, or whenever suspicions are aroused that he is dealing with an epidemic infectious process, it is the desire of the Health Commissioner that the Health Department be notified, in order to establish as early as possible the causal micro-organisms, to the end of anticipating and achieving an early control in what possibly might result in a widespread epidemic. This would also enable the laboratory men and the field workers in the Division of Communicable Diseases to carry out much needed research in respiratory affections. By these means the etiology may be eventually worked out, methods for control of epidemics devised, and, possibly, the basis for specific treatment and prophylaxis, by means of vaccines or sera, may develop.

Dr. Sanborn's communication is as follows:

Similarity in these cases reported by Dr. Ceconi suggests a common bacterial cause. As a carrier of infection, in this instance, neither the milk supply nor any other generally distributed food has been implicated. Fine particles of secretion, either coughed or sneezed, undoubtedly constitute the medium for transmission of the virus.

The highly contagious character of the disease, the clinical course, and the widespread distribution, suggest some bacterial invader other than those commonly held responsible for infections of the respiratory tract in the colder months.

The influenza bacillus comes to mind in this connection as being a possible cause. It is known to be pathogenic, but its specificity as a cause of epidemic influenza has not been completely proven. Nevertheless, it seems fairly well accepted that the influenza bacillus is responsible for epidemic respiratory infections from which it takes its name.

The influenza bacillus is not demonstrable in every case that has typical symptoms of the disease. For instance, Lord reports the finding of the influenza bacillus in the sputum of but three of twenty cases observed by him in 1907. Davis reports the influenza bacillus in only four cases in twenty-four clinically diagnosed as influenza. Courmont¹ states that, given the clinical symptoms pointing toward influenza in the time of epidemic, the fact that no influenza bacilli are found in a given case does not exclude this diagnosis.

Bacteriological examination was made in twelve of the above group of cases, as follows:

In 11, cultures were made from nasal secretion; in 9, cultures from the feces; in 7, cultures from the urine. Smears from the nasal secretion were examined in 12 of these cases.

The results of the examinations were as follows:

In three cases having very acute symptoms and discharge from the nose, smears showed numerous bacilli morphologically, and in staining reaction resembling in every way influenza bacilli. In two of these cases, the cultures upon human blood agar yielded growths also resembling the influenza bacillus. One of these cultures was lost in transplant. The cultures from the third acute case are alive and pure at the present writing.

Smears from the nasal secretion showed fairly numerous minute bacilli, some of them nearly round, the majority of them two or more times as long as broad, and with rounded ends. They occurred singly for the most part, but commonly in pairs, and sometimes in threes. Some of the fields showed a few longer forms. There was no capsulation seen. They decolorized by Gram's method and stained very light red with safranin counter stain.

Growth on Human Blood Agar. The tubes originally inoculated from nasal secretion showed merely scattered colonies of pyogenic organisms after twelve hours. At the end of twenty-four hours' incubation, it was possible, with the aid of a hand lens, to discern very minute transparent colonies,—separate, shiny, and with smooth borders. With the naked eye, these colonies could not be readily distinguished.

Pure cultures obtained give all the characteristics above noted. Freshly prepared human blood agar yielded the best growth. Similar agar several days old gave a slight growth or none at all. Colonies did not become confluent. There was no growth on plain agar. No motility noted.

The conclusion that the bacilli here described belong to the influenza group seems justifiable.

The percentage of positive cases in this group corresponds to that found in the two groups above noted, and clinically diagnosed as influenza. It is, therefore, a reasonable supposition,

not susceptible to proof, that in this group of cases we are dealing with one or more types of influenza.

In the original cultures, hemolyzing streptococcus, streptococcus viridans, micrococcus catarrhalis, and pneumococcus,—all possible causes of respiratory infection,—were found. Because of the presence of these possibly pathogenic bacteria, proof that the influenza bacilli found are the causal micro-organisms, is impossible. To this end, in these cases, or in any other similar group, the demonstration of specific antibodies in the blood of the infected patients is required.

AN ANALYSIS OF FOURTEEN CASES OF DIABETES MELLITUS UNSUCCESSFULLY TREATED BY FASTING.

By ELLIOTT P. JOSLIN, M.D., BOSTON,
WITH
F. GORHAM BRIGHAM, M.D., BOSTON,
AND
ALBERT A. HORNOR, M.D., BOSTON.

(Concluded from page 378)

GROUP III. DIABETES OF LONG DURATION.

Changes in the diet and régime of patients who have suffered from diabetes for many years are always dangerous, and particularly so with the cases of extraordinary length. Treatment of such individuals should never be undertaken lightly nor without a full realization of the gravity involved. This has been illustrated by Cases 295, 304 and 310. (See Joslin, *Diabetic Standards*, *Amer. Jour. of Med. Sci.*, Vol. 145, p. 474, and also Benedict and Joslin, *Carnegie Publication*, No. 136, pp. 118, 126, 1910.) These three were hereditary cases, and had suffered 9, 7, and 19 years, respectively, coming under supervision finally in a debilitated state. Even at that time the danger of changing the diet was appreciated, and unusual care was taken to prevent a fatal issue. The three cases died in a coma, one upon a sea voyage, one after unusual exertion and one for reasons unknown, in periods of 2½ years, 2 months and 5 months, respectively, after being seen.

Consequently, when Case 887 came for treatment, with a duration of the disease of 29 years, unusual apprehension was felt. For 9 days the patient was not allowed to make the slightest possible change in régime for, although she was wretched, she was alive. She was then admitted to the hospital, but with much foreboding, although no alarm was felt by other physicians, experienced in diabetes, who saw her. The following chart shows the progress of the patient.

¹ Courmont: "Precis de Bacteriologie," 3d édition, p. 768.

It will be seen that fasting for 9 days failed to rid the urine of sugar; indeed, upon the 9th day the quantity of dextrose in the urine was 17 grams, and the diet contained but 8 grams of alcohol. It is true that upon the second day after admission the urine was reported as sugar-free, but it is possible, although it cannot be proven, that this was an error. Acting upon this supposition, on this day 5% vegetables (150 grams) were allowed, but except for this day fasting was complete from July 31 to August 7. On August 8 three eggs were allowed; on August 9 three eggs, lean meat (30 grams); on August 10, 200 grams of orange and the whites of 3 eggs, but otherwise the patient took no food, save about 15 grams oatmeal on August 10, from her entrance to the hospital on July 30 to death on August 12.

This case constitutes a distinct failure, and in fact, the only one of those reported so far where there were no mitigating circumstances. And yet inspection of the chart gives good ground for belief that death might now be prevented.

The chart shows that the quantity of urine varied little for the first 5 of the 13 days. From then on it increased in amount, and it is here again significant that with it rose the nitrogen, except upon the second day before death. With the increase in the quantity of urine, there was no increase in acidosis, as shown by the ammonia. The carbon dioxide tension of the alveolar air did not change materially during the whole period, for it was 4.4% upon July 30, and 4% the morning of Aug. 11, but upon the following day, shortly preceding death, it was 2%, but an estimation made at this time may not have been wholly reliable. The inferences which were drawn from the behavior of the alveolar air were misleading. No great change took place in the quantity of sugar excreted. The dextrose-nitrogen ratio at the beginning apparently afforded no index whatsoever of the severity of the disease, though this statement cannot be made without qualification, because the sugar was estimated by rotation instead of by reduction. There are two features, however, which claim attention,—first, the change in weight of the patient from 132 pounds to 122 pounds in 10 days and the low excretion of salt. It would appear that the loss of water which this loss of weight represented might have been accompanied by a washing out of salt, as it is evident it was of nitrogen. This would in part explain the lack of correspondence between the dextrose-nitrogen ratio and the severity of the disease, although at the same time it shows that the mere recording of the dextrose-nitrogen ratio, without a simultaneous record of the weight, can be of little significance.

The salt was not determined except during the last few days of life. It is seen that in this period it was extremely slight, being respectively 4.3 grams, 2.8 grams, and 4.6 grams.

These low figures suggest that during the preceding 10 days salt was being lost along with body fluid, and in this loss of weight and body fluid is there not an explanation of the untimely death of the patient? The administration of sodium bicarbonate temporarily halted the progressive loss of body weight. When one compares this case with the preceding, the suggestion is striking that the addition of large quantities of salt to the diet might have led to the retention of body fluid and interrupted the downward course of the patient. A study of the literature shows, as has been pointed out in an earlier article (*Experiments on an Ash-Free Diet and Salt Metabolisms*, Joslin and Goodall, *Jour. A. M. A.*, 1908, Vol. li, p. 727), that the salt in the urines of diabetic patients dying in coma is unusually low. We should take cognizance of this, and efforts should be made to favor the retention of salt and water by severe diabetics. The retention of body fluid, which often goes hand in hand with the "oatmeal cure," may be one of the chief advantages which have been ascribed to that "cure." The liberal use of broths during the early days of fasting may be helpful in that they contain considerable quantities of salt and prevent loss of body weight. Case 941, who underwent a fasting cure elsewhere, lived upon water alone and lost 5.9 kilograms (13 pounds) in four days.

GROUP IV. INDEPENDENT COMPLICATIONS.

The remaining cases occurred in patients with complications independent of diabetes. In Case 869, there was a high blood pressure, mitral insufficiency and a history of Graves' disease. In another, Case 576, death followed 41 days after the removal of a cancer of the bladder which recurred in the scar of the incision. Vigorous antisiphilitic treatment probably was concerned with the death of Case 806, but no reason save arteriosclerosis could be assigned for the death of Case 848. The records follow in detail.

CASE 869. Female, age 46. Came under observation August 2, 1915. Although sugar was reported absent in January, 1915, its presence was discovered May 22, 1915. The symptoms pointed to the onset in May, 1913. Weight June 4, 1915, 134½ pounds. No acetone odor to the breath, thyroid moderately enlarged, pulse 120, blood pressure 160, with a previous record of 190, as was later learned from another physician. The diffuse and feeble apex beat of the heart was in the sixth space outside the mammillary line, and accompanied by a systolic murmur widely transmitted. The liver was palpable one finger's breadth below the costal margin.

The chart shows that on July 1 there was 4% of sugar in the urine and that this decreased to 2.6% and 1.4% respectively within two days after entrance to the hospital, and on the following day disappeared and remained absent, except for 0.2% during the last 24 hours. On the other hand, with the institution of fasting, acidosis appeared and in-

TABLE No. 4.

TABLE No. 4.																							
Date	Col. c.c.	Sp. Gr.	Reaction.	Albumin.	Acetone.	Diabetic Acid.	B-oxylutyric Acid.	Nitrogen, G.	Ammonia Total Gms.	SUGAR IN URINE.				DIET IN GRAMS.						Carbohydrate Balance Gms.	NaHCO ₃ Gms.	Naked Weight of Patient Pounds.	
										Reduction, %	Total (gms.)	Carbo- hydrate.	Protein.	Nitrogen.	Fat.	Alcohol.	Calories.						
June 1.....	Spec.	1025	Ac.			0				4.0		—	—	—	—	0	—	—	—	—	0		
2.....	"	1028	"			+				2.6		—	—	—	—	0	—	—	—	—	0		
3-4.....	12°	1019	"	0		++				1.4	8.4	0	0	0	0	13.5	95		—8.4	0		134	
4-5.....	1500	1017	"	0		++		11.7		0.0	0	0	0	0	0	27	189			4.25		133	
5-6.....	2100	1011	"	0	6.51	++	45.31	9.24	1.87	0.0	0	0	0	0	0	18	126			4.0		—	
6-7.....	1900	1011	"	0		++		6.08	1.28	0.2	3.8	20	2.7				91		+16.2			—	
7.....	12° 900		"	0		++						13	1.8				100					—	
* Total for three days, June 4-7.																							

creased, but never exceeded that degree represented by 1.64 grams of ammonia in the 24 hours. The ferric chloride reaction, however, increased in intensity and the urinary sediment directly after entrance showed a few hyalin casts and granular casts.

Vomiting began 4 days after admission and persisted until death the same day. The patient did not become unconscious, but undoubtedly succumbed to a relatively mild acid poisoning—incomplete coma. It has been pointed out elsewhere that a moderate degree of acid poisoning may cause the death of a patient previously free from acid poisoning, whereas acid poisoning of a severe character may be borne for years by a diabetic patient in whom it has gradually developed. Furthermore, acid poisoning in a diabetic with impaired kidneys is also serious.

Rapid changes in weight must have taken place in this patient, too, just as in Case 513, described under Infection, and Case 887, described under Diabetes of Long Duration. This is evident, because the patient retained no food for many hours, and yet voided during this period at least 2000 c.c. of urine.

This case and the two just cited have led us to direct our attention to the prevention rather than the treatment of acid poisoning.

CASE 576. Male, age 64. Came under observation January, 1913, reporting the onset and diagnosis of diabetes as having probably taken place in October, 1906. From January, 1913, until the summer of 1914, the patient did fairly well, but at that time a little blood was noticed in the urine. In October, 1914, he was operated upon by Dr. A. L. Chute. Fasting, followed a day later by 160 grams of oatmeal, was the treatment employed in preparing the patient for operation. Following the operation he progressed favorably so far as the diabetes was concerned, but he died 41 days later of a recurrence of the growth in the scar of the abdominal incision.

Syphilis. CASE 806. Male, age 38. Came under observation Dec. 17, 1914, reporting an onset of the diabetes in October, 1914. Venereal infection denied. The eyesight was failing, and the report of the eyes made by a competent oculist on January 9, 1915, was as follows:

"The vision of the right eye is reduced to counting fingers at one foot; that of the left to counting fingers at twelve feet. This reduced vision is due to retrobulbar neuritis. Fundus examination shows slight blurring of disc margins, with some tortuosity of the retinal vessels. There is nothing suggesting a retinitis due to diabetes. The visual fields are characteristic of those of a toxic amblyopia. Questioning him about alcohol and tobacco, it does not seem that he has used either to excess. Yet can find nothing else to account for the condition which the eyes show. It may be that diabetes for some reason predisposes to a more intense action of tobacco on the nerve cells. The question of its being due to multiple sclerosis suggests itself."

Pupils equal and reacted; knee jerks present but diminished. No cervical glands, but the inguinal glands were slightly enlarged, as well as the axillary glands. Thyroid normal, spleen extended 2 fingers' breadth below costal margin, right kidney felt, no edema. Heart normal, pulse 92, blood pressure 150, lungs normal. Acetone odor to breath.

Unfortunately, and as now appears, unaccountable, no Wassermann test was performed at the hospital, but it was later reported positive. It is mortifying that the possibility of syphilis did not occur to me or to the ophthalmologist and neurologist, who saw the patient in consultation.

On Dec. 17, 1914 the per cent. of sugar in the urine was 7.8%, but he became sugar-free after 2 days' fasting. The tolerance gradually rose to 24 grams carbohydrate, 50 grams protein, and enough fat to maintain weight. Following discharge, the patient remained in good condition under the observation of his physician, and, so far as I can learn, was sugar-free. In June, 1915, I heard from his physician that another doctor had obtained a positive Wassermann reaction, that 3 injections of salvarsan had been given, and mercury and iodide of potassium as well. Shortly after, the patient became suddenly ill and died in coma.

CASE 848. The cause of death in this case was unknown, but surely not related to fasting treatment. The patient was 54 years of age. Came under observation March 4, 1915, reporting the onset of diabetes one year before, and its diagnosis 2 months before. Physical examination showed marked arteriosclerosis, blood pressure 125, no enlarged glands, no acetone odor, pupillary and patella reflexes normal, heart and lungs normal. He entered the hospital March 4, 1915, showing 5.6% of sugar, and became sugar-free after fasting 2 days. He was discharged on March 20, weighing 145 pounds, with a positive carbohydrate balance of 45 grams. He returned for a day's observation August 26, 1915. The fasting stomach was empty, and a complete physical examination at this time showed nothing new, though the arteriosclerosis was very apparent. The urine was sugar-free. The weight was 153 pounds, which was the same as on March 5, 1915. He went home, gradually grew weaker, was especially exhausted during 3 very hot days in September, and the physician in attendance reported the discovery of malarial plasmodia. For this he instituted treatment, but the patient died without coma on September 19.

The experience derived from these patients has led us to adopt a preparatory treatment to fasting for very severe, long standing and complicated cases. It is simple and can be stated in the few words which we have incorporated in the following summary of directions for the treatment of diabetes. Except for the change in the paragraph on Fasting, it is essentially the same as that suggested in the *Amer. Jour. Med. Sci.*, for October, 1915, Vol. cl, page 485. For convenience we also insert the diet chart which we usually employ.

SUMMARY OF TREATMENT.

Fasting. Fast until sugar-free. Drink water freely and tea, coffee and clear meat broth as desired. In very severe, long standing and complicated cases, without otherwise changing habits or diet, omit fat, after two days omit protein and halve carbohydrate daily to 10 grams, then fast.

Carbohydrate Tolerance. When the 24-hour urine is sugar-free, add 150 grams of 5 per cent. vegetables and continue to add 5 grams carbohydrates daily up to 20, and then 5 grams every other day, passing successively upward through the 5, 10, and 15 per cent. vegetables, 5 and 10 per cent. fruits, potato and oatmeal to bread, unless sugar appears or the tolerance reaches 3 grams carbohydrate per kilogram body weight.

Protein Tolerance. When the urine has been sugar-free for two days, add 20 grams protein (3 eggs) and thereafter 15 grams protein daily in the form of meat until the patient is receiving 1 gram protein per kilogram body weight, or if the carbohydrate tolerance is zero, only $\frac{1}{2}$ gram per kilogram body weight.

Fat Tolerance. While testing the protein tolerance, a small quantity of fat is included in the eggs and meat given. Add no more fat until the protein reaches 1 gram per kilogram (unless the protein tolerance is below this figure) but then add 25 grams daily until the patient ceases to lose weight or receives not over 40 calories per kilogram body weight.

Reappearance of Sugar. The return of sugar demands fasting for 24 hours or until sugar-free. The diet is then increased twice as rapidly as before, but the carbohydrate should not exceed half the former tolerance until the urine has been sugar-free for two weeks, and it should not then be increased more than 5 grams per week.

Weekly Fast Days. Whenever the tolerance is less than 20 grams carbohydrate, fasting should be practised one day in seven; when the tolerance is between 20 and 50 grams carbohydrate, upon the weekly fast day 5 per cent. vegetables and one-half the usual quantity of protein and fat are allowed; when the tolerance is between 50 and 100 grams carbohydrate, the 10 and 15 per cent. vegetables are added as well. If the tolerance is more than 100 grams carbohydrate, upon weekly fast days the carbohydrate should be halved.

STRICT DIET.

MEATS, FISH, BROTHS, GELATINE, EGGS, BUTTER, OLIVE OIL, COFFEE, TEA AND CRACKED COCOA.

FOODS ARRANGED APPROXIMATELY ACCORDING TO % OF CARBOHYDRATE.

	5% *	10%	15%	20%
VEGETABLES (fresh or canned)	Lettuce Cucumbers Spinach Asparagus Rhubarb Endive Marrow Soybeans Sauerkraut Beet Greens Dandelion Greens Swiss Chard Celery Tomatoes	Brussels Sprouts Water Cress Sea Kale Okra Cauliflower Egg Plant Soybeans Cabbage Radishes Leeks String Beans Broccoli	Pumpkin Turnip Artichokes Pumpkins Squash Beets Carrots Onions Mushrooms	Green Peas Artichokes Pumpkins Lima Beans Boiled Macaroni
FRUITS	Ripe Olives (20% fat) Grape Fruit	Lemons Oranges Cranberries Strawberries Blackberries Gooseberries Peaches Pineapple Watermelon	Apples Pears Apricots Blueberries Cherries Currants Raspberries Huckleberries	Plums Bananas Prunes
NUTS	Butternuts Pignolias	Brazil Nuts Bl. Walnuts Hickory Pecans Filberts	Almonds Wal. (Engl) Beechnuts Pistachios Pine Nuts	Peanuts Chestnuts
MISC.	Unsweetened & Unsipped Pickle, Clams, Oysters Scallops, Liver, Fish Roe	* Reckon available carbohydrates in vegetables of 5% group as 3%, of 10% group as 6%.		

(30 grams 1 oz.)	PROTEIN.	FAT.	CARBOHYDRATE.	CALORIES.
CONTAIN APPROXIMATELY	G.	G.	G.	
Oatmeal, dry wt.	5	2	20	120
Meat (uncooked, lean)	6	3	0	50
(cooked, lean)	8	5	0	75
Broth	0.7	0	0	3
Potato	1	0	6	25
Rice	5	15	0	155
Cream, 40%	1	12	1	120
20%	1	6	1	60
Milk	1	1	1.5	20
Bread	3	0	18	90
Butter	0	25	0	225
Egg (one)	6	6	0	75
Brazil Nut	5	20	2	210
Orange or Grape Fruit (one)	0	0	10	40
Vegetables 5 & 10% group	0.5	0	1 or 2	6 or 10
Oysters, six	6	1	4	50

1 gram protein, 4 calories. 1 kilogram = 2.2 pounds.
1 " carbohydrate, 4 " 30 grams (g) or cubic centi-
1 " fat, 9 " meters (c.c.) = 1 ounce.
1 " alcohol, 7 " A patient "at rest" requires
6.25 g. protein contain 1 g. nitrogen. 25 per kilog. body weight.

Consult Chemical Composition American Food Materials, Bull. 28 U. S. Dept. Agriculture, by sending 10 cents to Bureau of Documents, Washington, D. C. also Annual Report Conn. Agricultural Experiment Station, New Haven, Conn., Food Produce and Drugs, 1913, Part 1, Section 1.—Free.

A SIMPLE METHOD OF OBTAINING RAGWEED POLLEN IN LARGE QUANTITIES.

By R. P. WODEHOUSE, CAMBRIDGE, MASS.

[From the Laboratory of Plant Physiology, Harvard University.]

OWING to the number of inquiries received from investigators in the field of hay fever therapy, it seemed desirable to print in an available form the writer's experience in preparing pollen extracts.

While working with Dr. Goodale on hay fever in the summer of 1915, the writer's part of the work (viz. isolation of proteins) necessitated the use of large amounts of ragweed pollen, so the following simple method of obtaining it was adopted:

The flower heads are stripped from young plants, just coming into bloom, and after being allowed to become almost dry, are crushed in a mortar with several volumes of carbontetrachloride. After thoroughly macerating, the liquid is strained off through muslin. Most of the pollen, liberated by crushing from the anthers, passes with the CCl_4 through the muslin and can be collected on filter paper and be washed with fresh CCl_4 , or with the same, after filtering out the pollen, to remove what pollen remains after the first washing.

The CCl_4 can be used several times, or until it becomes impregnated with oils, etc., when it should be replaced or distilled to remove the impurities.

This method is very rapid and was found to yield many times more pollen than any other known to the writer. Our experience has also shown that this treatment in no way interferes with the anaphylactic properties of extracts prepared from pollen procured in this way; but in order to get the best results only young plants, taken when the flowers are just opening, should be used, and these collected away from dusty roadsides.

Medical Progress.

RECENT PROGRESS IN PSYCHIATRY.

By HENRY R. STEDMAN, M.D., BROOKLINE, MASS.

PART II.

PROGNOSIS IN FUNCTIONAL PSYCHOSES.

Kirby¹ states that two views are held regarding the nature of functional psychoses, and the prognostic principles underlying them.

1. Kraepelin uses symptoms of prognostic value as basis for the formation of clinical groups. Reasoning on this basis, he thinks that analysis permits one to identify during the early stages of the disease certain symptoms, or

groups of symptoms, which indicate either a good or bad prognosis and differentiate between recoverable and irrecoverable cases. He maintains also that two processes are dealt with, but this view is not always true. At one time Kraepelin diagnosed 52% of his admissions as dementia precox, while in 1909 they formed but 7%, and of 468 cases called dementia precox, 29% were later diagnosed as manic-depressive psychoses.

2. Meyer's view, opposed to Kraepelin's, rests on the psycho-biological interpretation of these disorders, and emphasizes the importance of psychological effects as the dynamic factors. The view of the various forces at work as chains of cause and effect enables one to appreciate that psychoses are biological reactions of a mental type, and the disorder expresses defective adaptation of the individual. On this basis, the resistance of the individual is considered more important than the disease process, and prognosis is determined by the power of mental reaction. In the purest forms of manic-depressive psychosis, the malady is chiefly an emotional deviation and consequently correctible by reason. The prognosis, therefore, is good. In dementia precox the disorder is regarded as a result of long-continued biological maladjustment, the indications of which Meyer believes can often be detected long before the psychosis becomes obvious, a disorder in the realm of thought which causes a "failure of healthy interests and exclusion of normal thinking" and reacts on "the organic substructure of mental life, the brain"; consequently the prognosis is bad.

Kirby contends that there are a few biological reaction types which are useful as guides to prognosis, but there are also many types, not classifiable, in which "a rational prognosis can be determined only by a careful weighing of the dynamic factors in the individual case." To such biogenetic cases the general prognostic principles of Kraepelin are held to be inapplicable.

The validity of Kraepelin's contention that catatonic symptoms in non-organic cases are especially significant of a deterioration process is questioned, and it is shown from Kraepelin's own cases that catatonia has not the value assigned to it. The catatonic syndrome is not a clinical unit, is not confined to dementia precox, but found in organic cases and in infective exhaustive psychoses, and its real meaning and mechanism is unexplained. Its most typical manifestation, "negativistic-stupor," has the general characteristics of a defense reaction. The syndrome seems to be simulated in other disorders as well. Eighty well-defined cases of catatonia are analyzed and grouped as:

1. "Catatonic Psychoses Associated with Deterioration." Cases in which the catatonic reaction was preceded by a gradual change in the personality and in which there were ominous prodromes.

2. "Psychoses Essentially Catatonic Through-out by Ending in Recovery." Mostly cases of catatonic stupor or depression with catatonic behavior, a number of which lasted two years or more, and one five years, and recovered unexpectedly. Analysis of this stuporous case permits the statement that "when the psychosis is expressed exclusively or chiefly in an acute stuporous reaction the prognosis is good." Cases beginning with "odd behavior, grimacing and stereotypes, followed by gradual establishment of a stuporous condition with negativism and fixed postures" have a bad prognosis.

3. "Psychoses Presenting, Besides Catatonic Symptoms, Manic-Depressive Features." The over-valuation of the catatonic manifestation was the cause of error in many cases. A clear manic-depressive symptom picture and a typical catatonic syndrome were found at different times in the same individual, and in many cases catatonic phases replaced the depression in circular attacks.

The author concludes that: Very similar clinical pictures occur in deteriorating and non-deteriorating forms. The study of the constitutional tendencies and the mode of development of the psychosis gives more reliable prognostic data than the clinical picture. A history of gradual changes in personality, with indications of defective biological adaptation points to a bad prognosis. Acute stupors developing without characteristic prodromes have a good outlook. The psychological interpretation puts before us the possibility of modifying the dynamic factors in certain cases.

HEREDITY IN PSYCHOSES.

Jolly² offers a detailed and painstaking study of heredity in connection with the study of twenty-one families in which various psychoses occurred. He draws the general important conclusion that the former view, that there is a strong tendency for families so afflicted to die out in relatively few generations, is now untenable. His study shows that no degeneration or advancing depreciation of the family stock could be demonstrated. The degeneration of the race from a psychopathic standpoint, if such occurs, is not due to the appearance of endogenous psychoses, but rather to an injury of the germ-plasm, above all by alcohol and syphilis. A detailed statement of the types of psychoses occurring in the various families leads to interesting conclusions regarding heredity. The difficult subject can fitly be determined with fair scientific accuracy only by the collection and intensive study of a great number of families.

GASTRIC PSYCHONEUROSES.

Calligaris³ thinks that clinicians are too apt to regard the majority of stomach affections too exclusively as symptomatic, while neurologists regard them exclusively as purely functional

and of psychic origin. The treatment of these two extremes is exactly opposite, and woe betide the nervous dyspeptic who falls into the hands of a clinician who disregards the nervous element or, *vice versa*, the patient with organic trouble, whose precious time is wasted on psychotherapy alone. Calligaris classifies gastric neuroses in two types: the false, symptomatic or secondary, and the true, the essential or primary neurosis of the stomach. The history of this latter type is scarcely fifty years old. The symptomatology is rich indeed. The kaleidoscopic picture is the chief point in differentiation. Generally there are both sensory and motor symptoms. Vomiting may occur in this type, but the possibility of hematemesis of purely nervous origin is generally denied. Calligaris is convinced that this denial should not be too absolute, but he does not believe in the possibility of an exclusively gastric neurasthenia.

The examination of the stomach should be done with extreme caution and tact to refrain from suggestion that may add new features to the clinical picture. Organic trouble should be suggested more readily if the patient is near or past fifty. A purely functional stomach trouble may lead to an organic affection, thus setting up a grave vicious circle. There is no doubt that certain patients with true gastric neuroses have recovered under courses of dieting and medicines, but there is also no question of doubt that hosts of others have had their gastric neurosis bred into a chronic and possibly an incurable phase by such measures.

He has had an opportunity to study fifty individuals with true gastric neuroses. It was easy to trace the relation between cause and effect, between emotions, phobias, auto-suggestion and suggestion from others, and the development of the neurosis to follow day by day and hour by hour the course of the symptoms from the stomach as they paralleled the fluctuations in the moods and emotions, and to note the regular, transient aggravation of the neurosis after certain happenings, and the rapid and progressive improvement under psychotherapy. Disturbances in secretion, motor functioning and sensation, in patients growing more and more debilitated, disappeared surprisingly fast under appropriate psychotherapy, and the downward trend toward mental anorexia was thus arrested. Some of these patients had long complained of loss of appetite and inability to eat, and had lost from twenty to thirty-three pounds, but under eight or ten weeks of isolation and psychotherapy, they regained strength and almost their former weight. The outcome confirmed the correctness of the diagnosis and treatment; if treatment had been on the basis of an assumed organic trouble, the old disturbances would have been kept alight or fanned into a flame. It is in these cases that "local treatment kills; general treatment saves." Both Dubois and Dejerine believe that fully four-fifths of dyspeptic disturbances are of purely nervous origin.

Even reducing this figure by one-half, leaves a large number of which this is certainly true. They owe their origin to some emotional stress or to suggestion from within or without, and mostly to suggestion from some medical treatment which fixes the gastric neurosis still more firmly in the patient's mind, by the questions asked, repeated examination, restrictions in diet, and polypharmacy. "There are stomachs for the chemists and the radiologists, and also for the psychologists, the psychiatrists and the neurologists." He adds, "Nature presents her phenomena with a thousand aspects, but man is liable to see only the one aspect which his eyes have been trained to see."

(To be continued.)

Society Report.

WORCESTER DISTRICT MEDICAL SOCIETY.

A regular meeting of the Worcester District Medical Society was held in Grand Army Hall, Worcester, on Wednesday afternoon, December 8, 1915. The following papers were read:

1. Report of Committee on Control of Venereal Disease, Dr. Frederick H. Baker, Worcester.
2. Some Present-Day Problems in Surgery,* Dr. Michael F. Fallon, Worcester.

Harvard Medical School.

HARVARD MEDICAL SOCIETY.

HISTORICAL CLUB MEETING IN THE PETER BENT BRIGHAM HOSPITAL AMPHITHEATRE, TUESDAY EVENING, MARCH 7TH, AT 8.15 O'CLOCK.

DR. EDWARD C. STREETER, president, in the chair.

Paper of Prof. Joseph M. Flint, New Haven: Experiences in a Base Hospital in France.

THE Hôpital Français, New York, Fondation-Fitzgerald, was opened during the early part of last March. It was organized by Mr. Dwight who completed his arrangements through the French Ambassador in New York. It is situated about sixty miles southeast of Paris in a small village of some

three hundred inhabitants. This is within the fifth French military region.

The hospital has about one hundred and sixty-three beds. The buildings include an old château, the earliest portion of which dates back to the 15th century. A moat surrounding the château was constructed at the same period. The other buildings were erected in the early part of the 17th century.

The supplies for the present work come entirely from America. The equipment now is excellent and compares favorably with that of any American hospital. The personnel consists of four American surgeons, 12 registered nurses, a group of French volunteers corresponding to our probationers and an office force, in all between 50 and 67.

The problems which the unit headed by Dr. Flint had to face were those met with in any base hospital. Due probably to the fact that the hospitals were wholly inadequate at the outset of hostilities, the average American continues to believe the French Medical Service is still inefficient. This, however, is not the case. An authority on military medicine has recently stated that the French service is now superior to the German. This may be explained by the fact that the Germans have been the invaders.

One remarkable feature of the present conflict in France, is the relative fixation of the western battle line. This whole district is thickly populated and it is well supplied with railroads, good buildings and excellent roads. These conditions naturally permit a rapid transference of the wounded, and they furnish the necessary means for improvising satisfactory hospitals. Hence a new type of military surgery has come into being.

One of the most difficult tasks facing the organizing staff was to learn the duties of the sixty odd individuals who comprised the hospital's personnel. The problem was finally greatly simplified by constructing an organization chart in two colors, red for the military and black for the civil staff.

Food is now furnished at a cost of 1 franc 85 to 1 franc 90 per patient a day. When the hospital is fairly well filled, each patient can be housed and treated for about 5 francs 50 to 6 francs 25, like a well-run American hospital.

A man wounded in the first line of trenches usually receives the so-called first aid treatment, as soon as possible. He is then carried back through the communicating trenches to a shell-proof shelter of some sort where antitoxin may be administered, temporary splints applied or severe hemorrhage arrested. From here, as a rule, he is carried to where the reserves of the second line are stationed. An ambulance may now reach him. The ambulance then transports him to an evacuating centre, a hospital centre consisting of a medical and a surgical unit. The evacuating trains are made up at such a centre, and bearing the wounded to a base hospital in the interior.

There are a number of so-called distributing officers whose duty it is to keep themselves informed of the available hospitals and hospital beds. When a train is made up, such an official designates what base is to receive the wounded, and he telegraphs ahead informing each institution what cases they may expect. Ambulances at the base hospitals are dispatched to meet the incoming trains.

* See JOURNAL, page 407.

The hospital trains are of three types. The permanent trains of this nature are relatively few in number. The semi-permanent hospital trains consist of the ordinary civil day coaches which are constructed with sockets for stretcher racks, having in mind the possibility of such a future use. The old sleeping coaches corresponding to our own Pullmans are practically all used for the living quarters of the sanitary staff. The third type of train, the so-called temporary sanitary train, is made up of freight cars equipped with stretchers.

One of the interesting features of the transportation of the wounded is the attitude of the French toward the German prisoners. The innate courtesy of the French is so great, that the wounded Germans receive but little more notice than if they were arriving in a German instead of a French town. Another striking feature is the spirit and comradeship of the convalescents. Often these are little short of being remarkable. Those who can be up and about are always willing to perform any duty.

Very remarkable work is being done in the American Ambulance in Paris in the surgery of the nose and face. The great majority of the patients received at the Hôpital Français, New York, have wounds of the extremities or head. Only the chest cases without serious dyspnoea and those with non-penetrating wounds of the abdomen are sent back to the base hospitals. It is the bullet wounds with small sites of entrance, but large gaping exits, that led to the accusation of the use of soft-nosed bullets during the early months of the war. Patients with such injuries are wounded during the early trajectory of the bullets.

In the Hôpital Français, a special technique was developed for the localization of foreign bodies. The Profundameter method was found to be the best. After localizing the bullets or shell fragments in this manner, about 80% of the operations became minor operations, and were usually carried out under local anesthesia.

While secondary hemorrhage is very rare in civil work, it is relatively very frequent in this type of practice. This is due, in part, to the fact that the action of a high velocity ball extends for a comparatively long distance, beyond the tunnelled part of the wound.

The Germans have been using for some time shells containing a gas which is very irritating to the eyes. These have been called the tear-shells. While the gas leads to a marked conjunctivitis which lasts over several weeks, the vision, as a rule, remains unimpaired.

A mild type of erysipelas lasting two or three days is of very frequent occurrence in the French hospitals.

Carrel's fluid for disinfecting wounds was found to be very irritating. Gentian violet, suggested first by Dr. Churchman, proved to be most serviceable. In high dilutions it is germicidal for all gram-positive organisms, and it is not poisonous to the cells. In a strength of 1-5000 it is one of the best of all modern antiseptics. Its drawbacks are merely aesthetic in nature—discoloration.

The hospital contains beds bought 150 to 200 years ago, which were provided with supports for curtains to keep off drafts. These supports were found to be ideal for fracture beds.

There are now about 500,000 beds organized by the French for military purposes. When one remembers that France can pay only about fifty cents

a day per patient, one realizes that the type of service now given is little short of being remarkable.

(Lantern slides were shown to illustrate the paper).

Dr. W. T. Councilman: Some Letters from the Countries at War.

ERNEST G. GREY, M.D.

Book Reviews.

An Autobiography. By EDWARD LIVINGSTON TRUDEAU. Philadelphia: Lea, Febiger & Company. 1916.

The reviewer has had the rare privilege of knowing and talking with Dr. Trudeau many times during the past few years, and of receiving his wise counsel and advice in regard to the various perplexing problems concerning tuberculosis. Last spring, Dr. Trudeau read to him various portions from his then unpublished autobiography. It is, therefore, very much a labor of love to review this book.

There are too many autobiographies which consist merely of a catalogue of events, usually the more important and striking events in the life of the person concerned. A real autobiography should consist of more than this. Not only the great events, but various details, should enter in to make the volume not only a history of what this or that person has done, but a history of the thoughts, feelings, joys, and sorrows, as well as the achievements of the writer. This is what Dr. Trudeau has accomplished in a most remarkable degree. To the reviewer, who is most deeply interested in the subject to which Dr. Trudeau gave his life, the book is of absorbing interest. To everyone else, however, physician or layman, whether or not interested in the great problem of tuberculosis and its conquest, the description of what this man, terribly handicapped as he was, has done in the world and for the world will prove a source of comfort and inspiration.

The literary style is simple, straightforward, and yet so vivid that one suffers and rejoices with him in his journey through life. In the reviewer's opinion, this autobiography is a literary achievement of no small value.

This simple narrative should prove a tremendous help to all of us: to those of us who are in any way handicapped by sickness or circumstances, it will be a source of courage and a stimulus to renewed efforts; to those of us who are so fortunate as to be healthy and strong, it will be a constant reminder of what we ought to be able and, at least, ought to aim to accomplish, when we think of what Dr. Trudeau, "the beloved physician," has done in life.

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FIRST YEAR OF THE HARRISON NARCOTIC ACT.

THE provisions of the federal act regulating the dispensing and distribution of narcotic drugs, which went into effect March 1, 1915, were summarized in an insert in the JOURNAL of Feb. 18, 1915, and editorial comment followed in the issue of March 4, 1915. The profession has become accustomed to the slight annoyance caused by the necessary registration, with its attendant small fee, and has cooperated heartily in checking a great evil—the abuse of narcotics. From those who have been entrusted with the enforcement of the act we learn that druggists are very generally obeying the law, that the peddling of morphine and cocaine by vendors who had purchased the drugs on prescriptions from irregular practitioners of medicine has been very nearly abolished in this neighborhood, but that there are still unprincipled physicians who are making money in the following fashion: A morphine eater consults a physician whose name has been

given him by another addict and says, "Doctor, I am a morphine user. Will you prescribe for me?" "How much morphine are you accustomed to use?" "About ten grains a day." The doctor makes out a prescription for a dram of morphine and counsels the patient to use only so much as he directs. Whereupon the drug user departs to have his prescription filled and another unfortunate mortal with a craving takes his place. Naturally this is not the *lawful practice of medicine* within the meaning of the language of the act. To gather proof that the law is being evaded by this particular method of prescribing is by no means easy of accomplishment, and the federal authorities need, and should have, any assistance the right minded members of the profession can give in bringing to justice those who are thus stultifying themselves and their calling.

THE ARMY REORGANIZATION BILLS. PREPAREDNESS.

IN a recent hearing before the naval affairs committee of the House of Representatives, one of the Congressmen asked Capt. Thomas Washington, hydrographer of the Navy, a witness, what, in his opinion, was the most necessary thing for a nation to be prepared with, going to war. The captain answered, "A wise Congress." We are about to have a test of the wisdom of the men the people have sent to Washington to represent them, in their action on the Army and Navy reorganization bills, and we hope that the efforts of the late Dr. W. L. Rodman and other prominent medical men to have a sufficiently large medical department incorporated in these bills will bear fruit.

According to the terms of the House bill, the regular army of the United States is to be increased to a total enlisted force of 140,000 men, with a reserve of 60,000. The medical corps is increased by 8 colonels, 14 lieutenant-colonels, 60 majors, and 169 captains and first lieutenants, there being a clause as to the dental corps providing for 35 captains. It is provided that the enlisted force of the corps shall be equal to an equivalent of 5% of the total enlisted strength of the Army.

The Senate has before it an Army bill calling for a peace strength of 178,000 men and a war strength of 250,000. Section 11, having to do

with the medical department, provides for one major-general, 20 colonels, 40 lieutenant colonels, 214 majors, 622 captains or first lieutenants. The present medical reserve corps and nurse corps are continued as now provided by law. Provision is made for dental surgeons, one for each 1,000 enlisted men of the line.

It is reassuring to learn from the *Military Surgeon* that the reserve corps of the Army medical department has taken time by the forelock and now aggregates nearly 1,600 commissioned officers of recognized standing and proved ability. These officers are being organized into groups in the larger cities for purposes of instruction; more than 500 of them are taking the correspondence course from the Medical Officers' School at Fort Leavenworth, so that this branch of the service at least has already exercised effective foresight and preparedness.

The medical men of the country take an active interest in preparedness, realizing that this is one of the few benefits conferred on the United States by the present conflict in Europe, forcing home the importance of fostering patriotism and self-sacrifice for an ideal; in bringing a larger number of men into intimate relations with the high chartered personnel of the Army and Navy, thus restoring the service to its proper place of esteem in the minds of the people, and in repudiating the taunt of Europeans that we had become a nation of money-getters and money-worshippers. "An intellectual and vigorous nation can experience no worse destiny than to be lulled into a Phaeacian existence by the undisputed enjoyment of peace."

STATUS OF ARMY DENTISTS.

A SECTION in the proposed army reorganization bill at present pending before the National Congress, provides for raising the standard of the dental service in the United States army by making surgeon dentists eligible for promotion to the grade of captain and major. Under existing regulations, the limited opportunity for advancement in rank makes it difficult to attract and retain first-class men in this service. The Massachusetts Dental Society, and the National Dental Organization, which has a membership of 20,000, both earnestly advocate this measure. The experience of the European War

has shown conclusively the importance of dental surgery in armies, not only for the adequate treatment of wounds involving the jaws, but in the maintenance of health and efficiency among troops in times both of war and of peace.

RACE TYPES IN MAN.

IN the issue of the JOURNAL for March 4, 1915 (Vol. clxxii, p. 321), we published the first of a projected series of articles by Dr. John Bryant of Boston, presenting his researches on the carnivorous and herbivorous types in man; and in the same issue commented editorially on certain aspects of the significance of his work. In the issue of the JOURNAL for June 17, 1915 (Vol. clxxii, p. 881), Dr. Joel E. Goldthwait of Boston, in his Shattuck Lecture delivered that year before the Massachusetts Medical Society, discussed further certain of these aspects, particularly the application of the theory of human types to the anatomic and mechanistic conception of disease; and in the same issue appeared further editorial discussion of the question.

In the issue of the JOURNAL for September 9, 1915 (Vol. clxxiii, p. 384), we published the second in the series of Dr. Bryant's articles dealing with other general considerations concerning the carnivorous and herbivorous types in man and the possibility and utility of their recognition. In the same issue of the JOURNAL we again commented editorially on certain possible relations between physical types and professional efficiency.

The views advanced in these articles and editorials, however, have not passed unchallenged. In the issue of the JOURNAL for Jan. 27, 1916 (Vol. clxxiv, p. 127), we published an article from the standpoint of an anthropologist by Dr. E. A. Hooton, of Cambridge, in criticism of the theories developed by Dr. Bryant and Dr. Goldthwait. In the succeeding issue of the JOURNAL for February 3, 1915, (Vol. clxxiv, p. 160) we published a reply by Dr. Goldthwait to some of Dr. Hooton's comments.

In another column of the present issue of the JOURNAL we publish a further and more extended reply by Dr. Bryant, in which he dis-

cusses at length various points raised by Dr. Hooton with reference to the theory of human types and the importance of their recognition.

It is not our purpose editorially to attempt to judge the arguments brought forward on both sides of this purely academic and scientific discussion, upon whose merits readers should form their personal opinions after careful consideration of the problems involved. It is, perhaps, of interest, however, at this time, when the anthropological aspect of the subject has been brought into especial prominence, to call attention to an editorial comment that has recently appeared in the *Lancet* (Jan. 20, 1916) on the subject of race types in man, particularly with reference to the mixed and complicated ethnological conditions of the races of Europe.

"Since the almost entire disappearance from ethnology of the Aryans and the merging of the Celts in the Alpine stock of Central Europe, the old race divisions have practically vanished. It would, indeed, seem, in view of the now accepted doctrines as to the distribution of the long-headed and short-headed races throughout Europe, that the French are half Germans, the Germans half Celts, the Anglo-Saxons mainly Scandinavians, the Celtic Fringe not Celtic at all but Iberian. Even the Basques would seem to have ceased to be a homogeneous racial relic, and to be Iberians or Alpines according as they live south or north of the Pyrenees. Not a little of the Germanization of the older ethnologists may be said to have been due to the teachings of Max Müller, whose assiduously preached Aryans, emanating from a vague plateau in Central Asia, were virtually Germans. He was followed by Bergmann, among others, with his Scythian ancestry of the Slavonic and Teutonic races, and among ourselves by such brilliant historians as Stubbs and Freeman, who traced the institutions of our Anglo-Saxon ancestors to the German forests and to their denizens as described in the "Germania" of Tacitus. Historians such as Coote, with his theory of Roman influences, and anthropologists have for many years been fighting counter to these doctrines. By the aid of craniometry it is now pretty well established that Europe is at most divided between two or three strata of races—the dolichocephalic, the mesocephalic, and the brachycephalic. The dolichocephalic are the oldest, and are pre-Aryan. On the high authority of Ripley, Keith, Chalmers, Mitchell, and others we now know that the dolichocephals or long-heads, coming originally from the northern shores of Africa, have encircled Europe to the northwest as far as Finland. The short-heads are at most only a zone or offshoot in Central Europe of some race derived from Asia, and are, perhaps, the Aryans or Aryan Celts. They brought with them from be-

yond the Black Sea the Sanskrit language-drift, cremation, and the use of metals."

It may be taken for granted, we assume, that the dolichocephalic, the mesocephalic and brachycephalic types, to which this writer refers, roughly correspond to the carnivorous, normal and herbivorous types of Dr. Goldthwait and Dr. Bryant. "It does not by any means follow, however, that the brachycephalic is in any way inferior to the dolichocephalic in intellectual achievement or in capacity for civilization." Indeed the types exist side by side in nearly all the European races and are, perhaps, to be regarded as representing individual rather than racial evolutionary phenomena. In any event, this comment upon race types in man in the European countries is contributed for whatever value or bearing it may have upon the discussion relative to the anthropology of carnivorous and herbivorous types.

MEDICAL NOTES.

MEDICAL EDUCATION IN CHINA.—Earlier in the winter the JOURNAL reported the departure for China of a committee consisting of Drs. Flexner, Welch and Buttrick, to investigate medical education in that country and plan for its extension. This committee has recently returned to the United States and announces its purpose to establish two new hospitals in China to serve as units for the education of students in medicine and in nursing. This work is under the auspices of the Rockefeller Foundation.

TYPHOID FEVER IN THE UNITED STATES NAVY.—The recently published annual report of the surgeon-general of the United States Navy shows that during the fiscal year 1915 there were in the navy only thirteen cases of typhoid fever, with no deaths. In 1912 there were 222 cases with fifteen deaths. This improvement is attributable almost wholly to prophylactic inoculation.

PROPAGATION OF THE FEEBLE-MINDED.—After four years' investigation among the population of England and Ireland, the Royal Commission compiled statistics in 1912 which made it evident that the feeble-minded mothers of Great Britain have proportionately twice as many children as the normal. It should be noted, of course, that the birth rate among the very poor and feeble-minded is not an accurate index of permanent increase, since the low mental and financial status of the parents lessens the children's chances of survival. The infant death

rate in the illegitimate Kallikak line, for instance, was about six times as great as in the legitimate line.

NEW YORK DEATH RATE GOING DOWN.—According to an analysis of the vital statistics made by Dr. W. H. Guilfooy, Registrar of the Department of Health, 1603 persons died in the city of New York last week as compared with 1548 during the corresponding week of last year, and with 1628 during the previous week of this year. The death rate for the past week was 14.97 and 15.20 for the previous week, while it was 14.81 for the week ending March 6, 1915. Although 55 more deaths were recorded during the past week than during the corresponding week of last year, the increase in the population of the city accounted for all but 17. The total deaths from contagious diseases was 56, the same as during the previous week. The deaths from heart disease and Bright's disease, as well as the deaths from influenza, bronchitis and pneumonia, were less numerous during the past week than during the previous week. They were, however, slightly more numerous than during the corresponding week of last year. The death rate for the first ten weeks of 1916 is 15.94 per 1,000 population as compared with 14.78 for the corresponding period of 1915.

UNIVERSITY OF ILLINOIS.—It is announced that the University of Illinois has recently purchased for its School of Pharmacy, a new site and buildings, formerly erected for the Chicago Homeopathic Medical College and Hospital.

HARDINGE MEDICAL COLLEGE.—The Lady Hardinge Medical College and Hospital at Delhi, India, was formally opened by Lord Hardinge on February 17. The staff and plans of the hospital are announced as follows:

"Principal and professor of medicine, Dr. K. A. Platt; professor of anatomy and gynecology, Miss Hitton; professor of pathology, Miss Field; professor of anatomy, Miss Murphy; professor of chemistry, Miss A. M. Bane; professor of biology and physiology, Miss M. R. Holmer. It is expected that tuition will begin next September, and the government of India will contribute a lakh of rupees (about \$33,500) yearly to the annual maintenance charges."

LARGE HOSPITAL BEQUESTS.—The will of the late Robert R. Rhodes which was probated at Cleveland, Ohio, on March 8, contains a number of large bequests to hospitals and other medical institutions. Through the Medical School of Western Reserve University, a total of about \$500,000 will be devoted to medical charity and education. The Lakeside Hospital receives a bequest of \$250,000, the Charity Hospital, \$50,000, the St. Alexis Hospital, \$50,000, the Western Reserve Medical School, \$50,000, the Baby's Dispensary and Hospital, \$25,000, the Tubercu-

losis Free Dispensary, \$25,000 and the Maternity Hospital, \$25,000.

CROWN GALL OF PLANTS AND CANCER.—In previous issues the JOURNAL has commented from time to time on the work of Mr. Erwin E. Smith of Washington on the etiology of plant cancer and its analogy to cancer in man and in other animals. In a recent communication to *Science* (March 10, 1916) Mr. Smith reports from his continued experiments that he can now produce embryonic teratomata at will in plants by bacterial inoculations.

"All that is necessary is to inoculate growing plants in areas containing dormant totipotent or pluripotent cells, using *Bacterium tumefaciens*. Moreover, as in man, daughter tumors are produced freely and these also contain teratoid elements. These results have been obtained repeatedly during the last two months on *Pelargonium*, tomato, tobacco and citrus."

A full account of these experiments and results is to follow this preliminary announcement and will be awaited with especial interest by students in cancer research.

JEAN DE RUFZ DE LAVISON PRIZE.—Paul Becquerel of the Faculty of Sciences, Paris, has been awarded the Jean de Rufz de Lavison Prize. This is bestowed by the Academy of Sciences for work in physiology. Dr. Becquerel had done research work in the investigation of latent life in germs. "He studied first the duration of life in seeds known to have passed long periods of natural desiccation, including those from ancient tombs, hiding places and in different collections. He has eliminated as suspicious much material on which earlier essays have been founded, and these eliminations include the mummy corn and similar items. He has taken up the collections of the museums, where the age of the seeds may be precisely determined from the records, and fixes the limit of life in such seeds or spores at about eighty-seven years. The experiments have been conducted with a great variety of material and in many ways. Spores of Ascomycetes and other fungi were kept in the temperature of liquid air for a number of weeks and in that of liquid hydrogen for a number of days, but they germinated with apparently the same facility as the untreated spores. Experiments like this lead the investigator to incline to the hypothesis of latent life where the chemical activities are absolutely suspended. It is still desirable to wait, however, till more prolonged experiments can be made on the stability of protoplasm under conditions that are trying or in low temperatures."

REPORT OF JORDAN MEMORIAL SANATORIUM.—The Jordan Memorial Sanatorium for tuberculosis patients, situated in River Glade, New

Brunswick, states in its third annual report that it has treated 94 patients during the year, and has discharged 65. Of this number, 11 were unimproved, 25 were improved, 14 quiescent, 14 apparently arrested and 1 arrested.

EUROPEAN WAR NOTES.

ANTI-TYPHOID VACCINATION IN EUROPEAN ARMIES.—Some interesting figures on the results of anti-typhoid vaccination in the armies of the British and French have been published. They state that in the fifteen months preceding November, 1915, there were 1365 cases of typhoid among the British troops in France and Belgium. In groups of practically equal size in which the determinations were unquestionable, the mortality among those who had been inoculated was six per cent., and among those not inoculated more than twenty per cent. Similar figures are quoted for the French, whose total in typhoid was 1347. Here three-quarters had not been inoculated, and among these men the mortality was seventeen per cent. of the incidence, while among the inoculated it was three per cent. Further figures analyze the groups with reference to inoculations and the mortality of those who received one, two, three and four injections were respectively six, four, two and one-half and two per cent.

WAR RELIEF FUNDS.—On March 18 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	\$106,936.11
Serbian Fund	83,592.60
French Wounded Fund ...	60,870.54
Armenian Fund	35,365.18
French Orphanage Fund ..	32,665.22
Polish Fund	24,899.03
Surgical Dressings Fund ..	20,772.17
La Fayette Fund	19,568.53
Italian Fund	16,455.00
P. S. D. Fund	4,762.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending March 18, 1916, there were 267 deaths reported, with a rate of 18.31 per 1,000 population as compared with 269 and a rate of 18.74 for the corresponding week of last year. There were 51 deaths under 1 year as compared with 34 last year, and 78 deaths over 60 years of age against 95 last year.

During the week the number of cases of principal reportable disease were: Diphtheria, 47; scarlet fever, 44; measles, 115; whooping cough, 37; tuberculosis, 42. Included in the above were the following cases of non-residents: Diphtheria, 2; scarlet fever, 9; measles, 1.

Total deaths from these diseases were: Diphtheria, 7; measles, 3; scarlet fever, 1; whooping

cough, 3; tuberculosis, 21. Included in the above were the following deaths of non-residents: Diphtheria, 3.

MEASLES IN BROCKTON.—Report from Brockton, Mass., on March 11 states that measles is at present epidemic in that city. Nearly 100 new cases with five deaths have been reported since March 1.

“The latest serious epidemic of measles in this city was in 1909, when more than 700 cases were reported during the month of March. In 1904 there were nearly 1500 cases in March and February. The five deaths during the past week, however, have given this year's epidemic a more serious aspect. It is not confined to any one section of the city, and it may be necessary to close the schools, although that action has not yet been contemplated.”

THE CONCLUSION OF BABY WEEK.—It is reported that the Committee of Arrangements of “Baby Week” consider the venture a success, at least so far as attendance at most of its lectures was concerned. Addresses given at the various meeting places met with earnest attention and ready response. The widespread interest which popular movements of this kind create has hopeful significance for all who are active in public health work.

HOSPITAL BEQUESTS.—It is announced that the Choate Memorial Hospital of Woburn has received a gift of \$20,000, through the will of the late Mrs. M. Louise Beggs of Woburn. The money is to be used for the construction of an addition to the hospital, to be known as the William Beggs Memorial.

Through the will of the late Maria M. Browne of Boston, the Massachusetts Homeopathic Hospital has been made the recipient of a gift of \$5000.

Obituary.

BENJAMIN FRANKLIN CAMPBELL, M.D.

DR. BENJAMIN FRANKLIN CAMPBELL died at his home in Brookline, Mass., on March 9th, aged 81 years. He was born near Halifax, Nova Scotia, on Sept. 12, 1834, and was a graduate of the Harvard Medical School in the class of 1857. In 1858 he joined the Massachusetts Medical Society and was a Councillor from the Suffolk District Medical Society from 1890 to 1902, having his home and practising his profession in East Boston. During the Civil War he was Acting Assistant Surgeon, U. S. A., from May, 1862, to June, 1862, and from November, 1864, to January, 1865, when he was discharged. He was attached to the Army Field Hospital on the Pamunkey River, Virginia, and later was

assigned to the Webster United States Hospital at Manchester, N. H. Dr. Campbell served several years on the school board and had represented East Boston in both the House of Representatives and in the Senate.

He is survived by his widow, who was Miss Albina M. C. Anderson, and by a son and two daughters.

Miscellany.

CAUSES OF DEATH IN THE UNITED STATES.

THE census bureau of the United States Department of Commerce has recently issued a summary of its statistics of causes of death in the registration area in 1914. This area represents about two-thirds of the population of the country. Of the 898,059 deaths which occurred in that area in 1914, over 30% were due to tuberculosis, pneumonia and diseases of the heart and over 60% were due to these three together with cancer, diseases of the kidney and blood vessels, enteritis, diphtheria, diabetes and typhoid fever.

"The deaths from heart diseases (organic diseases of the heart and endocarditis) in the registration area in 1914, numbered 99,534, or 150.8 per 100,000 population. The death or mortality rate from this cause shows a marked increase as compared with 1900, when it was only 123.1 per 100,000.

"Tuberculosis in its various forms claimed 96,903 victims in 1914, of which number 84,366 died from tuberculosis of the lungs (including acute miliary tuberculosis). As a result of a more general understanding of the laws of health, the importance of fresh air, etc., due in part, no doubt, to the efforts of the various societies for the prevention of tuberculosis, there has been a most marked and gratifying decrease during recent years in the mortality from this scourge of civilization. In only a decade—from 1904 to 1914—the death rate from tuberculosis in all its forms fell from 200.7 to 146.8 per 100,000, the decline being continuous from year to year. This is a drop of more than 25%. Prior to 1904, the rate had fluctuated, starting at 201.9 in 1900. Even yet, however, tuberculosis has the gruesome distinction of causing more deaths annually than any other form of bodily illness except heart diseases, and over 40% more than all external causes—accidents, homicides, and suicides combined.

"Pneumonia (including bronchopneumonia) was responsible for 83,804 deaths in the registration area in 1914, or 127 per 100,000—the lowest rate on record. The mortality rate from this disease, like that from tuberculosis, has shown a marked decline since 1900, when it was 180.5 per 100,000. Its fluctuations from

year to year, however, have been pronounced, whereas the decline in the rate for tuberculosis has been nearly continuous.

"The only remaining death rate higher than 100 per 100,000 in 1914, was that for Bright's disease and acute nephritis, 102.4. The total number of deaths due to these maladies in 1914, was 67,545, more than nine-tenths of which were caused by Bright's disease and the remainder by acute nephritis. The mortality from these two causes increased from 89 per 100,000 in 1900, to 103.4 in 1905, since which year it has fluctuated somewhat.

"Next in order of deadliness come cancer and other malignant tumors, which filled 52,420 graves in 1914. Of these deaths, 19,889, or almost 38%, resulted from cancers of the stomach and liver. The death rate from cancer has risen from 63 per 100,000 in 1900 to 79.4 in 1914. The increase has been almost continuous, there having been but two years—1906 and 1911—which showed a decline as compared with the years immediately preceding. It is possible that at least a part of this indicated increase is due to more accurate diagnoses and greater care on the part of physicians in making reports to registration officials.

"Diarrhea and enteritis caused 52,407 deaths in 1914, or 79.4 per 100,000. This rate shows a marked falling off as compared with the rate for the preceding year, 90.2, and a very pronounced decline as compared with that for 1900, which was 133.2. Nearly five-sixths of the total number of deaths charged to these causes in 1914, were of infants under two years of age.

"Apoplexy was the cause of 51,272 deaths, or 77.7 per 100,000. The rate from this malady has increased gradually, with occasional slight declines, since 1900 when it stood at 67.5.

"Arterial diseases of various kinds—atheroma, aneurysm, etc.—caused 15,044 deaths, or 22.8 per 100,000, in the registration area.

"No epidemic disease produced a death rate as high as 18 per 100,000 in 1914. The fatal cases of diphtheria and croup—which are classed together in the statistics, but practically all of which were diphtheria—numbered 11,786 or 17.9 per 100,000, in that year, the rate having fallen from 43.3 in 1900. This decline of nearly 59% is relatively greater than that shown by any other important cause of death. The rate has not fallen continuously, but has fluctuated somewhat from year to year.

"Diabetes was the cause of 10,666 deaths, or 16.2 per 100,000. The rate from this disease has risen almost continuously from year to year since 1900, when it was 9.7 per 100,000.

"The mortality rate from typhoid fever has shown a most gratifying decline since 1900, having decreased from 35.9 per 100,000 in that year to 15.4 in 1914, or by 57%. This decline has been almost as great, relatively, as that for diphtheria, and has been greater than that for any other principal cause of death. The total number of deaths due to typhoid fever in 1914 was

10,185. The marked decrease in the mortality from this disease gives emphatic testimony to the effectiveness of present-day methods, not only of cure but of prevention. The efficacy of improved water-supply and sewerage systems, of the campaign against the fly, and of other sanitary precautions is strikingly shown by the reduction of the typhoid mortality rate to the extent of more than five-ninths in 14 years.

"The principal epidemic maladies of childhood—whooping cough, measles, and scarlet fever—were together responsible for no fewer than 15,617 deaths of both adults and children, or 23.7 per 100,000, in the registration area in 1914, the rates for the three diseases separately being 10.3, 6.8, and 6.6, respectively. In 1913 measles caused a greater mortality than either of the other diseases, but in 1914 whooping cough had first place. In every year since and including 1910, as well as in several preceding years, measles has caused a greater number of deaths than the much more dreaded scarlet fever. The mortality rates for all three of these diseases fluctuate greatly from year to year. The rates for measles and scarlet fever in 1914 were the lowest in 15 years, while that for whooping cough was considerably above the lowest recorded rate for this disease, 6.5 in 1904, although far below the highest, 15.8 in 1903.

"Deaths due to railway accidents and injuries totaled 7,062, or 10.7 per 100,000. This number includes fatalities resulting from collisions between railway trains and vehicles at grade crossings. The death rate from railway accidents and injuries is the lowest on record and shows a most marked and gratifying decline as compared with the rate for 1913, which was 13 per 100,000, and a still more pronounced drop from the average for the five-year period 1906-1910, which was 15 per 100,000.

"Deaths resulting from street-car accidents and injuries numbered 1,673, or 2.5 per 100,000. This rate, like that for railway fatalities, is the lowest on record and shows a material falling off as compared with 1913, when it was 3.2, and as compared with the average for the five-year period 1906-1910, which was 3.7.

"The number of suicides reported in 1914 was 10,933, or 16.6 per 100,000 population. Of this number, 3,286 accomplished self-destruction by the use of firearms, 3,000 by poison, 1,552 by hanging or strangulation, 1,419 by asphyxia, 658 by the use of knives or other cutting or piercing instruments, 619 by drowning, 225 by jumping from high places, 89 by crushing, and 85 by other methods."

The census bureau has subsequently issued a further bulletin in which it appears that the town of Wakefield has the lowest death rate in Massachusetts, and in this respect ranks eleventh in the United States. Its death rate per thousand of population for the year ended July 1, 1914, was only 8.9, as compared with 12.9 of the preceding year.

"The census is for 435 cities and towns of the country with populations ranging from 10,000 to 100,000 and represents about two-thirds of the total population of the country.

"The only other places having a better standing than Wakefield, Mass., are Berkeley, Cal.; Manchester, Ct.; Ishpeming, Mich.; West Hoboken and West Orange, N. J.; Norwood, O.; Bellingham, Everett, Tacoma and Walla Walla, Wash., and Kenosha and Marinette, Wis.

"In this state, next to Wakefield, Revere and Winthrop are tied with an average of 9.7, and other places having an average of only a fraction over 10 per 1000 are Webster, Leominster, Southbridge, Everett, Newton and Watertown.

"Taunton has the highest death rate—22.5—but there is an insane asylum there. Chelsea is next with 21.0."

SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-third meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, March 31, 1916, at 8.15 P.M.

The following papers will be read:

1. "Dystonia Musculorum Deformans, Oppenheim's New Disease of Children and Young Adults." Dr. Isador H. Coriat, Boston.
2. "Further Experiences with Homogenized Olive Oil Mixtures." Dr. Maynard Ladd, Boston.
3. "A Study of First Examinations, with a Report of Fifty Consecutive Physical and Mental Examinations of So-Called Well Children." Dr. William R. P. Emerson, Boston.

Light refreshments will be served after the meeting.

RICHARD M. SMITH, M.D., *Secretary*,
A. C. EASTMAN, M.D., *President*.

THE HARVEY SOCIETY.—The ninth lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, March 25, 1916, at 8.30, by Dr. R. T. Woodyatt, University of Chicago. Subject: "On Intermediate Carbohydrate Metabolism."

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at the Infants' Hospital, Tuesday, March 28, at 4 P.M., sharp. Telephone Brookline 5500. Inspection of Hospital, Business, Demonstration of diagnostic and therapeutic measures employed in infancy. The Censors will meet May 11, at 2 P.M., for the examination of candidates. Annual meeting May 9.

BRADFORD KENT, M.D., *Secretary*,
798 Blue Hill Avenue, Dorchester.

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the Peter Bent Brigham Hospital, on Tuesday evening, March 28, at 8.15 o'clock.

PROGRAM.

Informal Reports upon Current Work in Diabetes:
1. The Respiratory Quotient in Diabetes, Professor F. G. Benedict; 2. The Significance of Blood Fat in Diabetes, Professor W. R. Bloor; 3. The Carbon Dioxide Tension of the Alveolar Air in Diabetic Patients, Dr. A. A. Hornor; 4. The Prevention and Treatment of Diabetic Acidosis Without the Use of Alkalis, Dr. E. P. Joslin.

Medical students and physicians are cordially invited. Telephone, Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the Hospital.

The Boston Medical and Surgical Journal

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Original Articles.

CÆSAREAN SECTION: A CONSIDERATION OF INDICATIONS, TECHNIQUE, AND TIME OF OPERATING.

BY CHARLES M. GREEN, M.D., BOSTON,

From the Clinic of the Boston Lying-in Hospital.

ON June 29, 1907, the Boston Lying-in Hospital completed a series of one hundred Cæsarean sections; and the Staff published¹ a conjoint study of the series, dealing with the indications, technique, convalescence, the Cæsarean baby, and a consideration of the repeated sections. In the eight years which have since elapsed the total number of sections has risen above three hundred, and increased experience and observation of cases have led to certain changes of opinion as to time and technique of operation; the previously recognized indications have also been considerably extended. These changes in method and time of operating, in the ante-partum study and preparation of patients, and the enlarged indications for abdomino-uterine section may be shown in a measure by a consideration of a series of twenty sections which were performed during the writer's four months' active service, February to June, 1915.

In regard to the time of operating, the writer has come to the conclusion that except in certain cardiac, toxæmic, and placenta prævia cases it is generally best not to operate until the parturient has been in labor for a certain number of hours. In common with others he has always

seen the wisdom of giving time for a reasonable test of labor in the border-line cases; but aside from these, it had formerly been his custom to operate at an appointed hour on the predicted date of labor. This plan has some obvious advantages: the patient enters hospital just long enough beforehand to be prepared properly; she is definitely told when the operation will be done, and is thus not kept in a state of uncertainty and possible worry; an hour is fixed to suit the convenience of the hospital and the operator, and to meet the advantage of a teaching clinic. Agreeable as these advantages are, however, to a well-ordered hospital, observation and experience have convinced the writer that they are relatively insignificant in comparison with the advantages to mothers and babies of deferring operation, except under emergency conditions, until the advent of labor and until labor has progressed for a reasonable number of hours. These advantages of operating after labor has been for a time in progress may briefly be stated as follows:

First. *It is certain that the gravida has reached full term.* It is a notorious fact that many women are never sure of their menstrual dates; and when the date of latest menstruation is positively known and recorded, it is not known when conception took place, whether shortly after the cessation of a given monthly period, or just before the time for the next one. The records of any experienced obstetrician show a not inconsiderable proportion of cases in which labor has supervened three weeks and one, two, or three days later than the date predicted from the latest menstruation. Abdominal Cæsarean section is done largely in the interest of

the baby in elective operations, and it is a pity to deprive the baby of the last two or three weeks of intra-uterine development.

Second. *There is greater certainty that in the convalescence the uterus will have free drainage.* The writer has hitherto written and taught that when abdominal Cesarean section is performed before the advent of labor, the unobliterated cervix and undilated os uteri will generally relax and expand sufficiently to permit adequate lochial drainage. This he still thinks is generally true, but it is not invariably true; and the cases are not few in number in which the evidence of inadequate drainage makes post-partum dilatation of the cervix necessary. If the gravida who is to be delivered by abdominal section is allowed to labor until the cervix is taken up and the os uteri expanded to an inch or two, free drainage is assured, and the risks of lochial retention avoided.

Third. *There is less bleeding from the placental site.* Nature prevents bleeding by the process of retraction of the uterine muscular fibres: this process is a gradual one, beginning with the advent of labor; and it is reasonable to expect that when this process has gone on for several hours and the uterus is actively contracting, the placental sinuses will be more quickly closed than when the placenta is removed from a relatively flabby and inert uterus: experience justifies this expectation. Of course it is true that when incision is made and the baby quickly removed from the inert and non-contracting uterus, it will generally close down with reasonable promptness in strong, well-innervated women, and the bleeding may be inconsiderable; but experience seems to show that bleeding is much less, or even absent, when hysterotomy is done on the actively working uterus, in which muscular retraction has for a time been going on. No well-instructed third-year student would express the placenta after normal labor, in the absence of hemorrhage, until time had been allowed for adequate uterine retraction. Why, in the absence of conditions requiring it, should hysterotomy be performed before there has been time for at least a partial muscular retraction?

Fourth. *The uterine scar is stronger.* As far as the writer is aware there has been no animal experimentation bearing on this statement; but it stands to reason that the scar will be thicker and stronger if the closing sutures are applied to a uterine wall thickened by several hours of contractions, than when placed in the thin, comparatively flabby wall of a uterus incised before labor has begun. Indeed, in some of his repeated sections, performed after some hours of labor, the writer has found the general uterine wall much thickened, while the site of the scar is relatively much thinner. It is no wonder that those who, as a rule, perform gastro-hysterotomy before the advent of labor and therefore have resulting thin scars, believe that "once a Cesarean, always a Cesarean". Scars are likely to be thin and liable to rupture when the

closure is made on unretracted or insufficiently retracted uterine walls. But when the sutures are efficiently applied to a wall thickened by several hours of uterine activity, the resulting scar is as strong as, if not stronger than, the remainder of the uterus.

Fifth. *It is more certain that abdominal delivery is really necessary in the interest of mother, baby, or both, in the so-called border-line cases.* Every experienced obstetric surgeon will recall cases in which he had thought it probable, or even certain, that abdominal section would be necessary for safe delivery, which entered hospital and delivered themselves before the visiting surgeon could arrive. Some of these cases have had previous sections, but under changed conditions as to strength of pains and size of baby have delivered themselves. Humility is good for mortals, and it may as well be acknowledged that no man can say with certainty what any given woman may do in labor. Pelvimetry may be as accurate as skill and experience make possible; the size of the baby may be estimated with much exactitude; but no one can foretell what the character of the pains will be.

"It is a favorite procedure with some clinicians, in the border-line cases, to test the relative capacity of the pelvic brim by endeavoring to force the head into the pelvis by bimanual taxis. This method works very well in some cases; but it is generally painful, and its satisfactory performance often requires anesthesia. If the head can thus be made to pass the brim, well and good; but if it cannot, it is not proved that the head will not pass under the moulding of labor. To the writer it, therefore, seems a fairer test, in the border-line cases, to let the patient have a reasonable time, under observation, to show whether or not the head will mould into the pelvis. During this test, vaginal examinations should be avoided, and results be judged by external palpation," the third and fourth manœuvres, so-called, and by examination by rectum when necessary. "The foetal condition should also be watched, and the obstetrician should be in readiness to proceed to section with timeliness, if the test in a reasonable time does not indicate by gradual progress that safe delivery is likely to ensue".²

There is another advantage of a reasonable test of labor in the border-line cases: some women, whose ante-partum study has made it seem to the observer measurably probable that safe delivery can be accomplished only by gastro-hysterotomy, demur at this operation, and it is well for the obstetrician to hesitate in urging surgery on the unwilling patient; but if the parturient realizes her failure in efficiency, under reasonable test of her powers, she is more likely to become a willing subject.

CASE 1. A young Russian secundigravida, who had aborted in her first pregnancy two years before, placed herself under the care and observation of the Hospital at the end of her seventh month. The

pelvis was of the justo minor type, with a true conjugate at the brim of 8 cm., and the inter-tubera ischii measurement was the same. Early in the last month the pelvis was explored under anesthesia; the baby was estimated to be of average size then, and had presumably three or four weeks to grow. The head was still floating, and no attempt was made to engage it. It was thought extremely probable that the case would come to abdominal section; still it was regarded as a border-line case, and when the young woman entered hospital at term, having been two hours in labor, she was allowed to go on eight hours longer, when the head was still not engaged and section was decided on: the baby weighed seven pounds and eleven ounces. The temperature was 100° F. on the evening of the tenth day, otherwise it was never above 99°; and mother and baby were discharged well on the twentieth day.

Comment. In contrast with this case, which came to Cæsarean section, may profitably be mentioned a private case, a young American primigravida, a college graduate, with identical pelvimetry, but somewhat smaller baby, six pounds twelve ounces, which was safely delivered with forceps. Near the end of her second pregnancy it was evident that the baby was larger, and it was thought quite likely that it could not be delivered without injury through the 8 cm. justo minor pelvis; but the pains were excellent, and the young woman delivered herself, in a labor of twelve hours, of a baby weighing seven pounds twelve ounces. These two cases illustrate very well the sometimes forgotten fact that there are three factors in labor,—the power, as well as the passage and its passenger. In the former case the power was insufficient to mould and drive the head through the diminished pelvis: in the second labor of the latter case, with the same pelvimetry and with a baby one ounce heavier, the power was quite sufficient to overcome the same resistance. It is quite probable that in the former case the baby could have been delivered with high forceps, but with great likelihood of fatal compression and intra-cranial hæmorrhage: it is in this type of case that Cæsarean section has done so much for the conservation of fetal life.

CASE 2. An Irish sextigravida, aged thirty-six, after two early abortions, had been delivered in the Hospital of her first full-term baby in 1909: a high O.D.P. was rotated to an anterior position and high forceps delivery attempted; this failing, the baby, weighing eight pounds seven ounces, was delivered stillborn by internal podalic version. Eleven months after her discharge she re-entered in full-term labor, six hours after rupture of the membranes: no vaginal examination was made; but Cæsarean section was performed on the strength of her former disaster, the baby weighing eight pounds. Two years later she again was admitted, having been in labor for over four hours: section was performed after labor for fifteen hours without progress, with no vaginal examination made, the baby weighing eight pounds fifteen ounces. A hernia through the former scar was repaired, and the woman was discharged in three weeks with no

evidence of hernia, and the baby weighing nine pounds ten ounces. Two and a half years later she first came under the writer's observation when she re-entered, thinking she was in full-term labor. The pelvis was found to be only slightly contracted antero-posteriorly, the obstetric conjugate being 9.5 cm.; but the woman was of the thickset, fleshy type, and her pains were very feeble. There was a considerable hernia in the lower third of the old scar. After observation for twenty-four hours, it was thought best, in view of the history and evident parturient inefficiency, and further in view of the considerable ventral hernia, to deliver by section. The baby was her smallest, weighing only seven pounds. Incision was through the old scar: the hernial sac was dissected out, and on discharge three weeks later, after an afebrile convalescence, the hernia was apparently corrected.

Comment. This woman's bony pelvis was only slightly contracted; but she was of the fat, flabby type with feeble musculature, and the indication for section was inefficient power, rather than relative disproportion between passage and passenger. It is quite possible that this baby, weighing seven pounds, could have been delivered safely by turning and extraction by the foot, although this procedure had failed with a baby weighing eight pounds seven ounces. But it was desirable that the ventral hernia should be repaired, and good judgment seemed to indicate section in the surer interest of both mother and baby.

The writer cannot help believing that ventral hernia after Cæsarean section is generally attributable to hasty closure of the abdominal incision for a "time record". Except when the patient's condition is critical, which is seldom the case aside from the emergency conditions of toxæmia, hæmorrhage, and cardiac disease, there is no necessity for haste in closing the abdominal incision. And when this incision is closed by layer suture, and the fascia in particular is carefully brought together and overlapped, hernia should be a rare sequel to Cæsarean section.

CASE 3. An Italian quintigravida aged twenty-seven had had four difficult deliveries in other hands, and all the babies were stillborn. She applied at the Hospital two weeks before the calculated date for her fifth labor. The pelvis was carefully explored: the external measurements were normal, and the transverse of the outlet was 10 cm.; but the obstetric conjugate was found to be only 8 cm. The baby was thought to weigh not more than eight pounds. In view of the diminished conjugate, and especially of the disastrous obstetric history, it was decided to deliver by section, and this operation was performed at supposed term, for some unrecorded reason before labor supervened: the baby weighed seven pounds six ounces. After a normal, afebrile convalescence the woman was discharged well, and the baby three and a half ounces above its birth weight.

Comment. This case illustrates a fact which should be well known, that the normal external pelvic measurements of 28, 25, 20, do not neces-

sarily warrant a conclusion that the intra-pelvic measurements are normal. It also seems to point out that when a woman has lost several babies in birth, whether from inefficient *vis a tergo*, unrecognized pelvic contraction, or unskillful treatment in delivery, she is entitled to a fetus-saving operation which does not put her own life in serious jeopardy.

CASE 4. A negress of twenty-nine, primigravida, at supposedly full term, was referred to the Hospital from the Out-Patient Department for better observation on account of slight pelvic contraction. The pelvis was explored; but the contraction both in the conjugate at the brim and between the ischial tuberosities appeared to be only half a centimetre; the head, however, had not descended or even engaged, as it normally should have done, and the baby was thought to be not above average size; so it was deemed wise to let the woman take in labor and to observe results. At seven a.m. the next day pains were occurring every five minutes, and at eight-thirty a.m. the os uteri was an inch and a fourth dilated, the head being still not engaged. At two p.m. the head was still floating; but a rectal examination showed a large bag of waters reaching nearly to the pelvic floor, and indicating a probably full cervical dilatation. After another hour without progress, it was decided to proceed to section, and the baby, weighing seven pounds two ounces, was thus delivered after labor had continued for eight hours. The convalescence was complicated with cough, abdominal distention, and difficulty in moving the bowels; but the wound looked clean on removal of the stitches, and mother and baby went home well on the twenty-fourth day.

Comment. It might be said in criticism that if the membranes had been ruptured when the cervix was fully dilated the head might have moulded and descended, especially as it is a well recognized fact that the heads of negro babies are more plastic than those of the offspring of the white races. The writer can only reply that from his observation of the case and the character of the pains, this event seemed to him unlikely. Had the woman been a multipara with a history of safe delivery of an average-sized baby through the pelvis, the case would have been different. But the primipara is always an experiment, and the writer is chary of rupturing the membranes and expecting a primiparous head to mould and descend when it is still not engaged after eight hours of fair labor. Moreover, the development of a large bag of waters is good evidence that the head does not fit the brim effectively, as a good ball-valve.

CASE 5. A Russian primigravida of twenty-three took in labor at her home one week later than her expected date. Four and a half hours thereafter she was visited by two externe house-officers, both of whom examined vaginally and found the os dilated an inch and a half. Subsequently she was seen by an out-patient physician, who sent her into Hospital for better observation as a border-line case. The external pelvimetry was 27, 24, 18; the pelvis was not again explored vaginally. The head was high and not engaged; the baby was evidently not

over average size. It was decided the woman should have a further test of labor. Twenty-one hours after the beginning of labor, the pains being good and occurring every five minutes, there was still no engagement of the head, and the case was prepared for section. The baby weighed six pounds fifteen ounces. The convalescence was febrile: there was obvious intra-uterine sepsis, and consecutive phlebitis developed in the left and right leg; but the young woman recovered and was discharged on the thirty-ninth day, the baby being one pound over birth-weight.

Comment. It is not the custom of the writer's house service to examine vaginally to observe the progress of labor; but reliance is placed on external palpation, the third and fourth manœuvres, confirmed when necessary by examination *per rectum*.³ In the case above outlined, however, two vaginal examinations were made before the patient entered the Hospital.

CASE 6. A Canadian secundigravida of twenty had been delivered of her first baby in 1912, having entered the Hospital after being in labor five hours with ruptured membranes. Section was performed by the physician then on duty on the indication of pelvic contraction, the baby weighing seven pounds. Mother and baby were discharged on the twentieth day. After going home, the mother had an attack of pleurisy, and was ailing for three months. Two years and four months thereafter she applied for care in her second labor, for which the calculated date was three weeks distant. She was a small, frail woman, had not been at all well during her pregnancy, suffered from backache and fainting spells, and was in a very unprepared condition to undergo even normal labor. The pelvis was generally contracted, with an obstetric conjugate of 8 cm.: the baby was estimated to weigh seven pounds, and the presenting head was not engaged. Seventeen days later she again visited the Hospital and was persuaded to remain for such ante-partum preparation as the brief time before labor was due would permit. The head was still not engaged, and it was clear that the baby was too large safely to pass the contracted brim; but it was decided that the mother should be allowed to await the advent of pains and remain in labor for a reasonable time, partially to dilate the cervix and to thicken the uterine wall. Labor supervened a week later than the calculated date, and was allowed to continue for ten hours, no vaginal examination being made. Incision was made to the left edge of the old scar, and in closing the abdomen the scar of the first operation was resected. The placenta was under the incision, and there was a considerable blood loss in the brief time before suture could be applied. The baby weighed seven and three-fourths pounds. The convalescence was afebrile; but there was much operative shock, and seepage was required. The mother was discharged obstetrically well on the twenty-first day, the baby being nine ounces above birth-weight.

Comment. What "preparedness" to prevent or resist attack is to a nation is preparedness to undergo the stress of childbirth to a woman. The writer abstains from more than mentioning the subject in this paper; but he first wrote on the care and observation of pregnant women in

1891,⁴ and has taught and written to this end ever since.⁵ Until it is recognized by the profession and by the laity that women need preparation for labor as nations do for defense or actual warfare, obstetric results cannot be what they should be.

The writer once did a fifth Cesarean section on a woman who bore four abdominal scars. There seems to be no good reason why successive incisions should not be so made that former scars may be resected, and the woman be left with one scar, however numerous her sections may have been.

CASE 7. A Boston-born secundigravida of twenty-four had been delivered by section in 1912: she applied for care in her second labor two weeks before the calculated date. She was in excellent physical condition: the pelvis was contracted 2.5 cm. in all the external measurements, the true conjugate at the brim was 7.5 cm.: the baby was evidently above average size, and presented the shoulder left anterior, this mal-position obviously being due to the fact that the head could not find an engaging lodgment in the brim, and a breech presentation might well have resulted from the same cause. As directed, the young woman entered the Hospital on the date for labor, as calculated from the latest menstruation; but it was decided to await the advent of pains, not with any intention of giving a test of labor, but to afford the baby a chance for full development, and to secure a partial dilatation of the cervix, an active uterus, and a somewhat thickened wall. Labor did not begin until eighteen days after the calculated date, and section was performed after three hours of active pains, no vaginal examination being made. The incision was entirely above the umbilicus, by the side of the old scar, which was subsequently resected: the baby weighed eight and three-fourths pounds, and obviously could not have been delivered with safety through the pelvis. The convalescence was afebrile, and mother and baby were discharged on the eighteenth day.

Comment. There were two interesting incidents in this case: contrary to the rule there was a left lateral torsion of the uterus, so that the uterine incision was well to the right of the still visible scar from the first section; and the baby had an extensive pigmented hairy mole over the back and part of the abdomen, and scattered over the lower extremities, scalp, and forehead were brownish nevi varying in size from a pin-head to a silver dollar. The mother was advised to seek dermatological aid for the baby when it should be suitably developed.

CASE 8. An Austrian primigravida of forty was referred from the Pregnancy Clinic with mitral stenosis and regurgitation, and with beginning decompensation. She spoke no English and did not know her dates, but was apparently between the seventh and eighth months. There was some cough, and marked edema of legs and ankles. Four days later, under rest in bed and medical treatment, the lungs were clear, cough had disappeared, and the heart sounds showed much improvement; but there was still considerable visible edema. She

had a simple flat, non-rachitic pelvis, with an estimated obstetric conjugate at the brim of 8 cm., the span of the ischial tuberosities being 10 cm. The vagina and perineum were stiff and unyielding. After treatment for two weeks, compensation was restored, the heart sounds much improved, and the woman was discharged to the Pregnancy Clinic for continued occasional observation. Eighteen days later she re-entered the Hospital, thinking she was in labor, but proved not to be. The baby was much above average size, and the head was still floating. It had been decided earlier to deliver by abdominal section; but in view of the uncertainty as to when full term would be reached, operation was deferred until there should be definite evidence of labor. Meanwhile the woman remained in the Hospital, to her great general benefit. At one time it was found that the presentation had changed from head to breech; and five days later it had changed to head again. Labor began just three weeks after re-admission, and was allowed to continue without vaginal examination for three and a half hours, when section was performed with high abdominal incision: the baby weighed nine pounds three and a half ounces. The woman left the table with a pulse of 80, and made a smooth convalescence, the temperature never rising above 99.6°. Mother and baby were discharged on the nineteenth day.

Comment. There were three clear indications for section in this case: first, the pelvic contraction and large baby; second, elderly primiparity; even when there is no bony relative disproportion, there is much fetal risk in attempting to drag a baby with forceps through a pelvis with small, rigid vagina and perineum; third, the cardiac lesion; the short anaesthesia of section is relatively much less of a tax on the disabled heart than a long first stage, probably followed with operative delivery through the pelvis.

CASE 9. A tall and apparently well developed secundigravida, whose first baby was stillborn after instrumental delivery in another hospital, applied for care at the Pregnancy Clinic six weeks before the second labor was expected: thence she was referred to the House on account of a contracted pelvic outlet. It was found that while the diameters at the brim were normal, the ischial tuberosities measured only 8.5 cm. apart, the baby being of average size: it was decided that delivery by section was indicated owing to the funnel pelvis and disastrous first labor. The woman entered at full term after eight hours' labor: no vaginal examination was made; the head was lightly engaged. After she had been in labor twelve hours section was performed by high incision: the baby, weighing seven pounds one ounce, had several supernumary tragi, which were subsequently removed. The puerperal temperature reached 100° on the evening of the fifth and sixth days: the skin stitches were removed on the eleventh day. On the fifteenth day the temperature was 101° 4, and a redness was found around one stitch mark; this was dressed with creolin-wetted gauze and was soon well. There was, however, pain in the left leg: there was no evidence of phlebitis; but the knee was swollen and stiff, apparently from arthritis. The temperature was irregular for ten days, and there were

pain and tenderness in both knee joints: a gaultheria dressing was applied to both knees, and salicylate and bicarbonate of sodium were given internally. Seventeen days later the temperature had been normal for several days, the arthritis was improving, and the sodium salts were omitted. The next day, after six days of normal temperature, the patient had an attack of dyspnea lasting half an hour, the pulse and temperature being unaffected. The following day the woman sat in a chair for half an hour and appeared in good condition. In the evening the nurse noticed difficult breathing, and the house officer found a rapid, poor pulse and shallow respiration: the patient rallied under treatment, but suddenly had a convulsion, and died, apparently from embolism. No necropsy could be obtained. The baby was discharged well.

Comment. It is one thing for a baby to enter the pelvis and another thing for it to make a safe exit. The funnel pelvis is not a common, but an occasional deformity; and forceps delivery with undue force is likely to result in unsafe cerebral compression and consequent intra-cranial hemorrhage. There is no question that section is indicated, in the interest of the baby, in cases of marked contraction of the pelvic outlet.

CASE 10. A Russian secundigravida of twenty-eight had lost her first baby in instrumental labor in Russia. When apparently at the beginning of the ninth month, having no knowledge of her menstrual dates, she was referred from the Pregnancy Clinic on account of pelvic contraction. The pelvis was justo minor with an obstetric conjugate of 7.5 cm., the average sized baby presenting Sc.L.A. After the usual pregnancy care she entered the Hospital, having been in active labor for twelve hours. The position was still oblique with shoulder presenting; and the os uteri was thought probably to be fully dilated, inasmuch as the unruptured bag of waters presented at the vaginal introitus. She was delivered by high incision of a baby weighing six and a half pounds. In view of the fact that the fetal membranes had partially been pushed down through the unprepared vagina, it was thought unwise to deliver them through the uterine incision: the entire secundines were therefore pushed down into the vagina with two gauze strips, and subsequently delivered from below. After a normal convalescence, mother and baby were discharged, well, on the seventeenth day.

Comment. The writer believes that prior to abdominal section, or other obstetric procedure for that matter, the vagina should be cleansed with gauze, soap and water, followed with sterile water irrigation, as for a vaginal plastic operation. But in many hospital cases this is impossible: it is not well, however, to deliver through the uterus membranes which have been withdrawn from the unprepared and perhaps already infected vagina; it is easy enough, with a sterile gauze strip, thus not contaminating the rubber glove, to push the separated placenta and membranes into the vagina, whence they can be removed from below after the abdomen is closed. In this connection the writer would like to express his belief in the wisdom of taking

time and pains in the complete separation and removal of the membranes before the uterine sutures are applied. This is best done by everting the uterus through the incision or turning it inside out, one-half at a time; by this procedure the intra-uterine surface can be sponged visibly clean with gauze; this technique was followed in all this series of cases.

CASE 11. An Irish secundigravida of thirty-two was delivered instrumentally of her first baby, weighing ten and one-half pounds, in another hospital: the baby died in four days of intra-cranial hemorrhage. In the fifth month of her second pregnancy she applied for care at the Boston Lying-in Hospital. Pelvimetry seemed to show no contraction or deformity; of course it was too early to judge what the size of the baby would be at term, but it was not thought that abdominal section would be necessary. The writer did not see the patient again until she entered in labor, eighteen days after the date calculated from the latest catamenia. She had had pains for five hours: the baby was found to be much above average size, but surely not weighing as much as the first; the presenting head was in O.D.P. position, and not engaged. Naturally the woman was very anxious for a living baby after her primiparous misfortune, and was entirely willing to submit to section, if it were thought necessary. It was decided to subject the case to a reasonable test of labor without vaginal examinations. Eight and a half hours later the pains continued regular and of good strength, occurring every five minutes; but the fetal head was still floating, and the patient was prepared for section. The baby was delivered through a high abdominal incision, and weighed eight pounds and thirteen ounces: the mother left the table with a pulse of 90; her post-partum temperature never reached 100°, and she was discharged, well, on the sixteenth day, the baby weighing nine pounds three ounces.

Comment. The necessity for abdominal section in this case may perhaps be questioned. In earlier days, before the Cæsarean operation was as safe as it is now, anterior rotation of the occiput with the hand, followed with high forceps, would have been resorted to, or perhaps internal podalic version, and the result might have been all that could be desired. But there were two good reasons, in this case, for choosing gastro-hysterotomy: in the first place, although the pelvis was apparently of normal capacity, the head of the baby weighing less than nine pounds, did not engage after some fifteen hours of good multiparous labor, whether from undue thickness of soft parts or of pelvic bones is not clear; secondly, the maternal instinctive desire for a baby which would survive operative delivery. No obstetrician, however skilful and well trained, likes to take chances under these circumstances. A hospital patient, who had already had three Cæsarean sections, was once informed by the writer that he thought he could deliver her safely of her fourth baby through the pelvis by podalic version; but when, in reply to inquiry, he naturally said he was not sure,

the woman chose to be delivered by section, and the writer subsequently delivered her in the same way of her fifth baby.

CASE 12. A Newfoundland woman of thirty-seven in her seventeen years of married life had had eight normal deliveries. When supposedly five months advanced in her ninth pregnancy, she applied at the Pregnancy Clinic giving a history of having had, three years before, the following series of operations: trachelorrhaphy, colpo-perineorrhaphy with closure of the anal sphincter, appendectomy, closure of diastased rectus muscles, and ventral suspension(?). She was followed in the Clinic, and it was possible to appreciate by bimanual examination the thickened anterior wall of the lower uterine segment which had physiologically hypertrophied but could not expand in the latter half of pregnancy on account of its firm, broad attachment to the abdominal wall; the latter was very tense, thick, and boardlike from the operation for ventral hernia, and it was impossible to palpate the fetus through it. She entered in labor ten hours after pains began, but the pains were of poor quality. A single vaginal examination was made: the cervix could not be reached, owing to the extreme anteversion of the uterus, nor could a presenting part be pushed over the brim from above; anteriorly the lower uterine segment felt much thickened. After supra-umbilical incision the partially adherent veil of omentum was tied off and pushed aside. There was a broad, fibrous band running from the lower anterior abdominal wall to the anterior surface of the uterine body, which so far anteverted the uterus that the incision was largely in the much thinned posterior wall. The baby weighed eight and one-half pounds. The broad fibrous band was not interfered with. After a normal convalescence the mother was discharged with her baby on the eighteenth day.

Comment. Delivery through the pelvis would have been impossible in this case unless by jeoparding the mother and probably losing the baby. Perhaps no further comment is worth while; but it is fair to state that the series of operations to which this matron of thirty-seven was subjected could not have been performed by a surgeon of good obstetric training and judgment. The risks of utero-ventral fixation to women still in the childbearing period are well known to obstetricians, and should be well known to all who do abdominal surgery on women. There are many expedients by which the discomforts from a procident uterus can be alleviated until such time as a woman is not reasonably likely to become pregnant again; and after her puerperal voyage is over, she can then safely and effectually be put in gynaecological good order.

CASE 13. A Russian tertigravida of twenty-nine lost her first baby, weighing seven pounds thirteen ounces, from undue cerebral compression in high forceps delivery: she was advised by her attendant to have section performed the next time. Her second pregnancy, beginning a few months later, was followed in the Pregnancy Clinic, and the woman entered the Hospital in good condition five hours after labor began. The pelvis was simple flat non-

rachitic, with an obstetric conjugate of 8 cm. After she had been in labor ten hours in all, with good pains, the os was fully dilated; but there was no descent of the presenting head, and section was performed by the surgeon on duty, the baby weighing ten ounces more than the first. There was some infection of the abdominal incision. When mother and baby were discharged the scar seemed well healed; but hernia subsequently developed. Two years later the woman again applied in early pregnancy and was followed in the Clinic: there was a large hernia through the lower half of the old scar, and a smaller one at the level of the umbilicus. When she entered after five hours of labor she was allowed to go on five hours longer before the second section was performed. The baby weighed seven pounds fifteen ounces. The old scar was resected, the hernial sacs dissected free and tied off, and when mother and baby were discharged on the nineteenth day the incision was apparently solid. A month later two small superficial sinuses appeared, but closed after the emission of a catgut suture.

Comment. It is fair to say that in some thin, stretched out, multiparous abdominal walls it is very difficult to differentiate the layers, and in closing them the operator can do only the best he can. But the writer believes that hernia can almost always be avoided, if time is taken to do a painstaking closure layer by layer when possible. For some years he has overlapped the fascia and applied a mattress suture of No. 2 catgut. One of the reasons why some operators prefer the supra-umbilical incision is that there is less risk of post-operative hernia, because the weight of the abdominal contents is chiefly borne by the infra-umbilical wall. Since he last wrote on this subject⁶ the writer has changed his opinion, and now believes that except when there is some new growth or other condition requiring easy access to the pelvis, the supra-umbilical incision is on the whole preferable.

CASE 14. A small, poorly developed woman of twenty, who had early aborted her first conception, entered in her first full-term labor, with rather feeble pains. She had not been in the Clinic and had had no ante-partum preparation whatever. Examination by rectum showed that the cervix was not obliterated. The external pelvimetry was 23.5, 20.5, 16.5 cm.: the baby was small, and the presenting head was not engaged. The pains became more active, and labor was allowed to proceed for thirteen hours, the head meanwhile not engaging, when a five-pound baby was delivered by high incision. There was a moderately febrile puerperium for the first ten days; but the young mother was discharged well, on the eighteenth day, with the baby above birth weight.

Comment. It is always a pity when there is no opportunity for careful ante-partum study of the pregnant woman. In the above case the indication for section was clear enough from the pelvimetry and non-engagement of the small head. But aside from the value of general preparation and supervision during pregnancy, the obstetrician can do his best work when he is permitted to study his case beforehand in a series of observations.

CASE 15. A Russian primigravida of twenty-four applied six weeks before full term, and there was time for a careful study of the case. The pelvis was of the generally contracted, flat, rachitic type, with marked lumbar lordosis: the obstetric conjugate was 7.5 cm., the transverse of the outlet, 9.5 cm. Although the baby was palpated to be below average weight, it was thought that delivery by section would be necessary. When the woman entered in labor she had had pains for five and a half hours; but the cervix was not taken up and the head was movable at the brim. Labor was allowed to continue six hours longer, eleven and a half hours in all, to dilate the cervix to some extent, and to thicken the uterine wall, when, the head being still not engaged, a six and three-fourths pound baby was delivered by high incision. The post-partum temperature was normal on the evening of the second day, and thereafter never rose above 99°. Mother and baby were discharged, well, on the sixteenth day.

Comment. In none of this series of cases was the uterus eventrated before the baby was delivered; indeed, the writer has long since given up this earlier technique. He has also discarded the rubber dam of former days. It is easy to protect the peritoneal cavity by placing a long, moist, gauze strip, and after the uterus is emptied it is simply lifted through the short incision for the better inspection and sponging of the mucosa and application of the two layers of sutures.

CASE 16. A Russian primigravida of twenty was sent in from the Out-Patient Department after twelve hours of labor, with the presenting head of an average-sized baby still not engaged at the brim. She had had no ante-partum study or pregnancy care. The pelvis was just minor, but the contraction was slight. Examination by rectum showed the cervix taken up, two inches dilated, and the membranes not ruptured. Section was performed on the indication of minor pelvic contraction and the non-engagement of the head after twelve hours of good labor. The seven pound one ounce baby was delivered through supra-umbilical incision, and the uterus sponged clean. During the night there was a smart secondary hemorrhage, with subsequent elevation of pulse and temperature; but after the fifth day the convalescence was smooth, and mother and baby were discharged, well, on the sixteenth day.

Comment. It is quite possible that this baby might have been delivered safely by podalic version; high forceps was not to be thought of on a non-engaged, un moulded head, even if in anterior position, and the writer thought it wiser not to take the chances of version and extraction for the baby. It is possible, too, that if the woman had been allowed to go six to twelve hours longer in labor the head might have moulded through the brim; but if it should not have done so, and section were then performed, the prognosis for the mother would have been less favorable. One hesitates, in these cases of minor relative disproportion, to deliver by section when the patient has been examined vaginally with doubtful aspsis, and the fact that

there has been such examination is likely to influence the obstetrician to take chances with the baby rather than with the mother. After all, each case must be decided in accordance with the training, experience, and judgment of the responsible doctor or of his consultant.

CASE 17. An American primigravida of twenty-three, in the care of the Pregnancy Clinic, was referred to the House two weeks before the calculated date of labor on account of moderate pelvic contraction and non-engagement of the fetal head. The pelvis was found to be just minor, with an obstetric conjugate of 8 cm.: the case was put on file to await developments. The woman entered on the expected date, not in labor; but four and a half hours later labor began, with pains every five minutes. Labor was observed for six hours, and as the head did not engage, section was performed by high incision, and the baby, weighing seven and three-fourths pounds, delivered. It was then found, with surprise, that the placenta was previa with marginal attachment: there had been no bleeding during pregnancy nor during the six hours of labor, and nothing that would suggest the possibility of a previa, unless it were that the head did not engage; of course the ectopic placenta does sometimes interfere with engagement, but in this case the pelvic contraction was sufficient to prevent the head of a seven and three-fourths pound baby from settling into the brim.

After the removal of the placenta there was considerable bleeding, and the pulse became rapid and of poor quality. The condition improved under heaters and blankets, with salt solution under the breasts and by rectal seepage; but seven hours later the patient was restless, the pulse 140 and feeble. She improved during the day, but in the late afternoon again bled profusely, with large clots, rapid pulse, and shallow respiration: under treatment with salt solution, morphia, caffeine, and subcutaneous ergot she again improved and there was no more bleeding. Uterine sepsis ensued, with definite spasm and tenderness in both lower quadrants, and with relaxed, tender uterus: later there was a purulent discharge from the uterus, containing a piece of catgut; but under treatment with ergot, ice to the abdomen, and Fowler's position the woman made a good recovery and was discharged with her baby above birth-weight on the twenty-fourth day.

Comment. This case illustrates very well the two great dangers of ectopic placentation,—hemorrhage and infection, and these dangers are ever present by whichever route delivery is effected. The reason seems to lie in the fact that the uterus retracts much less effectively in the lower segment below the contraction ring; and when the placenta is seated wholly or in part in the lower segment, the sinuses, less well closed by muscular retraction, must be closed by thrombosis. The soft, friable thrombi are easily displaced by coughing, sneezing, any bodily movement, or even by the venous blood stream, and, furthermore, are good culture media should infection be introduced.

It is not the writer's purpose in this paper to give his views on the treatment of placenta prævia: reference is made to what he has recently written on this subject; but he would express

the opinion that there is no one treatment for this unfortunate and always dangerous complication, the course to be followed must be decided in each case according to its conditions. One disadvantage in the delivery by section when the placenta is prævia is that one hesitates to pack the bleeding uterus: to be effective against hæmorrhage the intra-uterine pack must be applied very firmly; what effect such a firm, tight packing would have on the uterine sutures, the writer has never learned by experience. If the writer had known that the placenta was prævia in the above reported case, he would have elected to deliver by section, as he did do, because of the pelvic contraction, because the patient was a primigravida, and because there was a good-sized baby in good condition at full term; and however delivery is effected, unless the fetal life is disregarded, there is and always will be a considerable jeopardy to the mother.

CASE 18. An American primigravida of twenty applied for care three weeks before the calculated date of labor. The pelvis was just minor with an obstetric conjugate of 8.5 cm. The baby was not above average size, and the presenting head was not engaged. It was regarded as a border-line case. The young woman entered ten days after the date, having been in labor eight hours: the head was still not engaged. Labor was observed for eight hours, partly to see whether the head would engage, and partly to dilate the cervix and thicken the uterine wall in case section should be found advisable. After a labor of sixteen hours in all, the head still floating, the baby, weighing half an ounce over seven pounds, was delivered by high incision: the mother left the table with a pulse of 90, and after an afebrile convalescence went home with the baby, on the twenty-second day.

Comment. If this baby had been delivered on the predicted date of labor, it would have lost, as it proved, ten days of intra-uterine development: under the rules of fetal growth this would have amounted to ten ounces,—surely an adequate reason, in the absence of maternal emergency, for deferring section until labor begins. It may be said in objection to delaying section after labor has once begun that the maternal prognosis is less good, that the fatigue of some hours of labor will injuriously diminish the parturient's strength and resistance to infection. Such, however, is not the writer's experience; and it should be remembered that the effect of the labor on both mother and baby should be closely watched when section is thus deferred, and vaginal examinations abstained from.

CASE 19. An American primigravida of nineteen applied at the Pregnancy Clinic when six months advanced, and thereafter the welfare of the mother and development of the baby were regularly studied. The pelvis, like that of so many American young women, was undeveloped and generally contracted: the obstetric conjugate was 7.5 cm., or 3 inches. Unless with a very small baby, this conjugate might well be accepted as an absolute indication for section; but it was decided to

give a reasonable time in labor, not so much with an expectation that the floating head would engage, but for the other reasons already dwelt upon. When the young woman entered the Hospital at the calculated date, labor had been in progress for two hours, and she was observed three to four hours longer. It was then not believed that the head would enter the pelvis, and it was thought that there was a sufficient cervical dilatation and thickening of the wall. The baby, weighing six and seven-eighths pounds, was delivered by high incision, and the post-partum maternal pulse was 100. There was some fever in the first six days, but the convalescence was afebrile thereafter, and the mother and baby were discharged, well, on the twenty-fourth day.

Comment. It has been a matter of congratulation in this country that our young women were not exposed to working conditions which in Europe so frequently result in the so-called occupational deformity of simple flat non-rachitic pelvis; but so far as childbearing is concerned, the justo-minor pelvis of imperfect development, so often observed in young American wives, high and low, rich and poor, is quite as productive of pathologic labor. Sometime, perhaps, the physical development of our young women will be more carefully supervised, as we advance in socialism; and perhaps young women of seventeen to twenty will be advised not to marry until they have endeavored to reach full physical development. In the meantime, there may be some measure of gratitude felt towards those of the medical profession who have made it possible for imperfectly developed women to have a family of children by the now comparatively safe procedure of Cæsarean section.

CASE 20. An Italian nonigravida of thirty-three came to the Hospital and through an interpreter implored that she might have a Cæsarean section, the nature of which she seemed to understand, and, indeed, she pointed with her finger where she would be cut. The history was that she had had eight children, all delivered *per pelvim*, and all stillborn: she begged for a living child. She was four feet eight inches tall; the pelvis was of the simple flat rachitic type, with an obstetric conjugate of 7.5 cm.; the span of the ischial tuberosities was 10.5 cm. The unfortunate woman was assured that she would be delivered by section at full term. She did not enter hospital, for some unknown reason, until she had been in labor for more than thirteen hours: section was performed by high incision four hours later, the baby weighing seven and three-fourths pounds; she left the table in excellent condition. There had been no adequate bowel preparation, and for several days there was considerable distention; but this was relieved on the third day by a very large defecation. There was some infection of the incision, without affecting the temperature; but the happy woman went home with her baby on the twenty-seventh day.

Comment. There was an absolute indication for section in this case in the degree of pelvic deformity; but if the pelvis had been normal, as far as pelvimetry could determine, a humane

medical attendant would have seen a clear indication in the series of obstetric disasters which the unfortunate woman had suffered. As soon as the mother was out of either her baby was, by direction, placed in her arms. It is not difficult to understand the unspeakable joy it is to a woman, especially when former labors have resulted disastrously, to take to herself her first living baby; and she should be given this great happiness before, perchance, the baby should succumb, as it does occasionally, to some irremediable congenital defect, or indeed before the mother herself should sustain a fatal embolism or other puerperal catastrophe.

Summary. Of the twenty cases outlined above one mother died of embolism. There was no fetal loss. From his present knowledge and experience the writer would emphasize the following conclusions:

1. Every pregnant woman should receive painstaking ante-partum study and adequate general care, to the end that the obstetrician may understand the conditions with which he will have to deal, and the mother may be in the best possible physical condition for what she is to undergo.

2. Except under emergency conditions section should be deferred until the advent of labor and until labor has progressed under observation for a reasonable number of hours,—this not only in border-line cases, in which a test of labor is desired, but also when the indication for section is absolute.

3. During the observation of labor vaginal examinations should be avoided, and progress noted by external and rectal palpation.

4. The vagina should be prepared before Cæsarean section, whenever possible, the same as for any surgical procedure in or through the vagina: this should be done with gentleness and care so as not to traumatize the mucosa.

5. Except when easy access to the pelvis is necessary, the supra-umbilical incision is preferable.

6. There is no reason for eversion of the undelivered uterus.

7. The uterine wall should be painstakingly sponged clean of membranes and clot before its closure: this can readily be done by sight by inverting the uterus, half at a time, through the uterine incision.

8. When the membranes have more or less descended into the vagina, it is safer to push the placenta and remaining membranes down and deliver them from below, than to remove them through the uterine incision.

9. The uterine wall, thickened by some hours of muscular retraction, should carefully be closed with deep and sero-serous absorbable sutures.

10. Time should be taken for a triple-layer suture of the abdominal wall, especial care being used with the fascia, which is best closed with overlapping and mattress-stitch.

11. The uterus was created a movable organ: it should be allowed to remain so, in married women, until after the climacteric.

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MODERN INDICATIONS FOR CAESAREAN SECTION.*

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(This paper will be confined to the mechanical indications for Caesarean section, in order to keep within normal limits of time and space.)

I BELIEVE that it may be assumed that the aim of successful obstetrics is to secure 100% of living mothers and 100% of living children. To go still further, no obstetric case can be considered to have resulted with perfect success when the mother is left in a state of invalidism, or permanent injury has been done to the child. It is, perhaps, too much to expect that the practice of obstetrics will ever quite reach this ideal state; nevertheless, it should be our constant endeavor to approximate it.

Probably no branch of medicine or surgery has been more hampered with mediaeval superstition than obstetrics. Of the obsolete traditions whose influence is still felt, two may be singled out as particularly pernicious.

The first of these is the teaching that 95% or more of all cases of labor will terminate spontaneously if left to nature.

The second is that the hard high intrapelvic operations, while having a considerable fetal mortality, are without danger to the mother.

I shall not take up your time to discuss the first of these superstitions. The experience of every practitioner has refuted it. It does not seem to be so generally understood, however, that the difficult intrapelvic deliveries have a maternal as well as a fetal mortality, and, as I shall show, that this mortality is essentially as great as that of early Caesarean section.

It has been extremely difficult to find honest statistics in the literature, but after much search I have collected a few, which are presented in the first chart.

* Read before the Chirurgical Society of Boston, April 23, 1916.

INTRAPELVIC OPERATIONS.

CHART I.

Author.	Cases.	Maternal Deaths.	Fetal Deaths.
Lipsky ¹ (Moscow, 1899-1912) . . .	225	2	—
Leopold ² (Dresden)	773	20	215
Gans ³ (Königsberg)	562	4	—
Zernicke ⁴ (Breslau, 1902-1907) . .	396	2	16
Peham ⁵ (Vienna)	244	2	—
Edgar ⁶ (New York)	252	0	25
Nebesky ⁷ (Innsbruck)	302	3	27
Susanow ⁸ (Moscow)	222	4	63
Total	2936	37	346

Maternal mortality..... 1.2%

Foetal mortality..... 17.2%

I have edited these statistics and excluded all deaths from eclampsia, placenta prævia and extra-pelvic conditions, reducing the causes of maternal death to shock, hemorrhage, infection, rupture of the uterus and pulmonary embolism. The mortality (1.2%) represents the results in some of the best obstetric clinics in the world. The average fetal mortality in these same clinics is 17.2%; and this does not include the paralytics, the idiots and the epileptics resulting from these deliveries. If in good hands the maternal mortality is 1.2% and the fetal 17.2%, one can only conjecture what these will rise to in the hands of poorly trained practitioners.

The destructive operations, as one would expect, present a still higher mortality. Pinard⁹ and Bar¹⁰ in Paris, Hannes¹¹ in Breslau, and Gushee¹² in New York, give the mortality as 11.5%, 9.39%, 5.1% and 11.4% respectively. It may be argued that these statistics run back into prehistoric times, but fortunately one has to go back a considerable distance to get together statistics on craniotomy.

Now as to Caesarean section, Reynolds¹³ in 1907 collected all the Caesarean sections performed during the preceding ten years by obstetricians who had done at least five operations. He classified them under three headings:—

1. Primary.
2. Secondary.
3. Late.

He classified as *Primary Caesarean Sections* all those done before the onset of labor;

As *Secondary Caesarean Sections*, those done early in the first stage; and

As *Late Caesarean Sections* those done after six hours of strong pains, or where the os was dilated more than the size of a half-dollar.

There were 82 primary operations with 1 death, a mortality of 1.2%; 158 secondary with 6 deaths, or 3.7% mortality; and 49 late with 6 deaths, 12.2% mortality.

From these results, Reynolds argued that the primary Caesarean section was a very safe procedure, the late Caesarean a very dangerous procedure, and that the test of labor in doubt-

ful cases should be abandoned, and either Caesarean section done before the onset of labor or the patient allowed to go on to a spontaneous delivery or a craniotomy.

With the first two of his conclusions there can be no difference of opinion. That so far as possible Caesarean sections should be done before the onset of labor is desirable for many reasons, but that Caesarean section after labor has begun should be discarded, I cannot agree.

In the first place, given a clean patient, under clean conditions, handled with strict asepsis from the start of labor, and with unruptured membranes, there is no good reason why a few hours of labor pains, or one or two vaginal examinations should increase the mortality.

Second, while the pelvis can be measured, the size of the baby estimated, and the relation of the head to the brim determined before labor, there are still a few important factors which cannot be foretold. These are the exact date of labor, the amount of moulding and degree of ossification of the head, the resistance of the soft parts and the way the uterus is going to act.

In the Dresden¹⁴ clinic, in 6,865 contracted pelvis, spontaneous delivery or low forceps terminated labor in 88%.

in Breslau ¹⁵	64.2%
in Tübingen ¹⁶	81. %
in Baltimore ¹⁷	75-80. %
in Bonn ¹⁸	66. %
in Vienna (Chrobak) ¹⁹	54.5%
in Vienna (Braun) ²⁰	37. %

Most of us remember patients who, after a hard operative delivery with perhaps loss of the baby in the first pregnancy, have had a rapid normal labor with the second.

It seems to me more practical to divide Caesareans into two classes rather than three, that is to say, uniting Reynolds' primary and secondary operations in one group, which I should call early, and including all patients operated on before twelve hours of labor. Those operated on after this time or after attempts at delivery have been made I should classify as late Caesarean sections. With these last, however, it is not my intention to deal.

The recent literature of Caesarean section is enormous, and it would be a stupendous task to cover it. I have collected from the literature, going through only the more important journals for the past few years, all series of ten cases or over reported by the same operator or from the same clinic, excluding as far as possible all except early Caesarean sections. Large series of operations are often reported in such meagre detail that undoubtedly some late Caesarean sections have been included in this list.

In 846 cases of early Caesarean section there were 14 deaths, a mortality of 1.6%, which is approximately as low as Reynolds' figure for primary Caesarean section and one per cent. lower than the mortality for early Caesarean sections made by combining groups one and two

CAESAREAN SECTION.

CHART II.

Author.	Cases.	Deaths.
Richter ²¹	107	0
E. P. Davis ²²	103	1
A. B. Davis ²³	129	4
Kouwer ²⁴	60	1
Fischer ²⁵	60	1
Green ²⁶	60	1
Boyd ²⁷	48	0
Humpstone ²⁸	25	0
Shäfer ²⁹	50	2
De Lee ³⁰	49	2
Fenton ³¹	25	0
Good ³²	20	0
Ward ³³	28	0
Brown ³⁴	27	0
Rachmanow ³⁵	30	2
Prince ³⁶	8	0
Warren ³⁷	6	0
Williams ³⁸	14	0
Total	849	14

Maternal mortality 1.6%

of his paper, thus showing that our results are constantly improving.

Another large group of statistics appearing in the literature is that collected by Routh,³⁹ of 1,282 Caesarean sections by British operators. Of these there were 469 early cases, with 14 deaths, a mortality of 2.9%. I have not included these cases with my statistics, because they represent the work of 100 different operators, extending back over a period of nearly forty years.

The mortality from Caesarean section is still too high, but I believe will continue to improve. The statistics I have given were in large part collected from hospital clinics. Now it is a matter of observation that hospital patients stand laparotomies worse and difficult operative deliveries better than private patients. The reason for this is obvious. The greater cleanliness of the private patient, and the better physique and endurance of the hospital patient are satisfactory explanations. Therefore, figures collected entirely from private practice would undoubtedly be even more favorable to Caesarean section.

Two other procedures which have been devised for use in border-line cases remain to be discussed:—

Pubiectomy, and

Extraperitoneal Caesarean section.

Pubiectomy has never been received with enthusiasm in this country, and certainly cannot be considered as a competitor with Caesarean section performed in advance of labor. Its disadvantages are obvious. Its field of application is limited to pelves whose conjugata vera is over 7 c.m., rendering it useless in pelves of marked contraction. It is a mutilating operation. Deep tears of the soft parts, and bladder

injury, are common. It does not infallibly, accident excepted, guarantee a living baby as does Caesarean section. Its technic is difficult, requiring many assistants, constant guarding against injury of soft parts and contiguous organs, and a much greater degree of obstetrical skill than does Caesarean section. It cannot be performed until after some hours of labor, as the cervix and birth canal must be partly softened up before delivery can be undertaken.

All writers agree that pubiectomy is contra-indicated in the presence of infection, and is, therefore, ruled out in late cases.

Finally, the actual results of pubiectomy have not been as good as those of early Caesarean section, as shown in the accompanying chart. Pubiectomy has a mortality of 2.6% as compared with 1.6% for early Caesarean section.

PUBIECTOMY.

CHART III.

Author.	Cases.	Deaths.
Roth ⁴⁰	85	2
Van de Velde ⁴¹	40	1
Jellet ⁴²	19	0
Harbleicher ⁴³	16	0
Freeland ⁴⁴	9	0
Jacobson ⁴⁵ (All American cases) ...	53	3
Total	222	6

Maternal mortality 2.6%

The extraperitoneal Caesarean section is still on trial. There are, according to Nicholson,⁴⁶ some twenty modifications of this operation. Space forbids us to discuss these in detail, but for practical purposes they may be divided into transperitoneal and true extraperitoneal Caesarean sections. The chief examples of the former are the operations of Frank, Sellheim, and Veit and Fromme. While differing in details of technic, the general principle is the same in all. The peritoneal cavity is opened. The uterine peritoneum is incised and stripped off the anterior face of the uterus and united to the cut edges of the parietal peritoneum either by suture or clamps, thus excluding the peritoneal cavity before opening the uterus.

Of the true extraperitoneal types of operation, those of Doederlein and Latzko are the best known. In these the peritoneum is not opened, but is dissected upward, after a low incision is made through the other layers of the abdominal wall, and access to the uterus is obtained through the parametrial tissues. The disadvantages of this type of operation are many.

1. Difficulty of technic.

2. It exposes the parametrial tissues to infection and contraindicates the operation in late cases.

3. Injury of the bladder, and opening the peritoneal cavity are common.

Since the operation affords no advantages over the classical Caesarean section in early cases, and is contraindicated in the late cases where the classical Caesarean is also contraindicated, it is evident that the true extraperitoneal Caesarean is not of much value.

My experience with extraperitoneal Caesarean section has been limited to one case done by the transperitoneal method,—unfortunate in its outcome, but particularly instructive. This patient, a primipara with an absolute Caesarean pelvis, entered the City Hospital last February, not in labor, and with a completely detached normally situated placenta. Under these conditions Caesarean section seemed the only possible method of delivery, and as I knew nothing about the previous handling of the patient, I chose the extraperitoneal method. A low median incision was made and the peritoneal cavity opened. The uterine peritoneum was incised transversely just above the bladder reflex and stripped off the anterior face of the uterus upward for a distance of about five inches, and the edges of the uterine united to the edges of the parietal peritoneum by a continuous catgut suture. The peritoneum thus being excluded, the uterus was incised in the median line and the child delivered by forceps. Closure of the uterine wound and abdominal wall by interrupted suture, in layers, with drainage of pre-uterine space.

The patient unfortunately died of embolic pneumonia on the fourth day, which gave us, however, an opportunity to investigate post-mortem the technical success or failure of our operation. Although the patient's condition had been so poor that the union of the peritoneum of uterus and abdominal wall had been done hastily, the entire operation occupying less than twenty minutes, and although there had been free bleeding on opening the uterus, not a single clot nor a bit of excess fluid was found in the peritoneal cavity post mortem. This proves that, anatomically, at least, the operation presents some possibilities for use in infected cases.

EXTRAPERITONEAL CAESAREAN SECTION.

CHART IV.

Author.	Cases.	Deaths.
Küstner ⁴⁵	100	2
Weibel ⁴⁶	67	2
Baum ⁴⁷	26	1
Balsch ⁴⁸	50	1
Richter ⁴⁹	12	1
Total	255	9

Maternal mortality 3.5%

Now as to results,—255 cases with 9 deaths, a mortality of 3.5%, which, considering that many of these were in late and infected cases, is

good. The description of technic in most instances was so hazy that I have not tried to separate the various types of operation in this table, but have put them all together.

My position in regard to the management of labor in contracted pelvis is as follows:—

In marked cases of pelvic contraction and cases of marked disproportion between the head and the pelvic brim, Caesarean section should be done before the onset of labor.

All primiparae where the head is high at the end of pregnancy, whether or not there seems to be any disproportion between the head and the brim, and even if the pelvic measurements are normal, should be regarded as possible candidates for Caesarean section until a few hours of labor have demonstrated whether the uterus can drive the head through the brim.

High forceps and version are unjustifiable operations in the primipara at term, being no safer for the mother than early Caesarean section, and having a fetal mortality of over 17%, besides permanent injuries to the brain and nervous system.

Pubiotomy is a complicated and difficult operation, having a very limited field of application, and even in this field produces no better results than Caesarean section.

The extraperitoneal Caesarean section of the transperitoneal type offers a possible advance in our methods of handling late and infected cases.

I wish to mention two other indications for Caesarean section:—

1. High abnormal presentations in the primipara.
2. Late primiparity.

1. Under high abnormal presentations I should include the high breech, high face and transverse in the primipara. What I have said in another paper⁵² regarding Caesarean section for primiparous breech it appears to me applies equally to the other abnormal positions.

"The existence of one of these presentations in a primipara always means some disproportion between the fetus and pelvis or between the fetus and uterine cavity. Unless it can be definitely established that this disproportion is one of absolute or relative small size of the fetus, Caesarean section before the advent of labor should be the method of choice for delivery."

2. All primiparae over the age of 35 are best delivered by Caesarean section, because of the rigidity of the tissues. A recent writer⁵³ has tried to show by statistics that the only effect of age in primiparae is a slight increase in the duration of labor and a decided increase in the number of forceps deliveries. But while in some late primiparae delivery is not attended by great difficulty, in a not inconsiderable proportion of these cases an attempt at delivery by the natural passage will result in deep tears, profound shock and loss of baby. Therefore, in view of the safety of abdominal delivery for both

mother and baby, the method of choice in these cases should also be Caesarean section.

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CAESAREAN SECTION—OVERDONE.

BY FOSTER S. KELLOGG, M.D., BOSTON.

CAESAREAN SECTION is the most overdone operation in this community at present.

Caesarean section is overdone for many reasons. The principal one is that the idea—or delusion—prevails that it is an absolutely safe procedure. The principal reason it is considered safe is because it is simple. That does not follow. I shall try to show that Caesarean section is not especially safe.

De Lee, quoting Routh's series of 1280 Caesareans done in Great Britain to 1910, states that there has been a steady decrease in mortality until now in favorable cases the mortality is between 2 and 4%. In cases of prolonged labor when forceps had been attempted, the mortality was 34%. The general mortality was 11.6%; for the last five years 8.1%. Cases operated at the beginning of labor with membranes intact

showed a 2.2% mortality. De Lee says further: "In spite of most rigorous asepsis and a perfect technic, the operation has a high morbidity. Infected suture material has caused the most trouble in my cases, and the secondary union has been followed by four hernias that I know of. Ten of the forty-nine cases had severe febrile reaction, 1 marked peritonitis (re-operation, recovery), 3 post-operative pneumonia, 4 uterine abscess, and there were 2 cases of temporary ileus, 2 of dilatation of the stomach (all with alarming symptoms). Two women died, 1 from peritonitis, 1 from nephritis, the operation being undertaken for eclampsia. Taken all in all, it is not an operation to be lightly advised." "Polak in 1909 collected 150 cases of repeated section which showed a mortality of less than 5%."

Reported statistics with varying mortality can be added, series of 20, 30, or more cases without mortality have been reported; but the fact remains that about 5 women of every 200 subjected to elective Caesarean section at the most favorable time will die; and that about 20% of cases done for reasonable indication, but not under most favorable circumstances, will be sick. These figures may be shifted up and down at will by altering indications and circumstances. From the results with which I am familiar, without analyzing them at the present time because they will presumably be carefully analyzed and published in the future, I see no reason to consider that the results in Boston in excellent hands and favorable surroundings, operated at the time of election, are better in 1913 and 1914 than the above. In one public hospital, for example, the mortality from 1913 in January to 1915 in May was about 8% in 75 odd cases. By adding 13 cases without a death to August 31, 1915, we reduce the mortality to about 6.5%. By taking the last 42 cases alone, we can call the mortality 0. The purpose of these figures is only to show that there is still an appreciable death rate.

Outside of public hospital practice, I am familiar with 10 recent cases which illustrate the danger of the operation *per se* in private work, in private well-equipped hospitals in the hands of well-trained obstetricians. Presumably these cases were indicated; it is not the purpose to show that they were not. Seven of the 10 cases died; 3 recovered after being so sick that whether they lived or not seemed a matter of chance. What proportion these cases represent of the whole number of Caesareans done by this group of men is not the point. They occurred within a year in this community among a small group of good obstetricians.

It seems fair to admit at least, from above statistics, from these cases, and from anybody's experience with hospital cases, that Caesarean section is as quoted from De Lee above, "not an operation to be lightly advised."

On what indications is it being advised in this

community? The honest answer is, "Almost anything that keeps a baby from flopping into the world itself." We may omit discussion of the accepted reasons for doing Caesarean: for absolute pelvic indication, for relative pelvic and fetal head indication, for impacted pelvic tumor, for central placenta previa with tight long cervix, for atresia of vagina, for certain *ablatio placentae* cases with tight os. Nobody questions Caesarean for these indications; with them, if the patient dies, it is on nobody's conscience. The best has been done.

Let us look at some other indications that have been advised and see if on losing a patient by Caesarean for one of them the operator's conscience can be as clear.

(1) Primary Caesarean Section for Women with Unfit Nervous Systems and General Make-up. No men were better able to see this type of case and in better position to determine the theory of treatment than the authors of this theory at the time of its original promulgation. At present, however, with gas-oxygen anesthesia, it is possible to carry such a patient through a labor, or to a place in it where operation is safe, without strain. C. H. Davis of Chicago tells me he has used it eleven hours; it has been used hereabouts five or more, and can be longer. Scopolamin-morphine anesthesia in the hands of its trained advocates can be used for the same purpose in this type. It seems, therefore, that this indication is now limited strictly to the physically unfit, probably a very rare type.

(2) Caesarean Section for Primiparous Breech, where the presentation is not due to a manifestly small baby in relation to the pelvis. Any man fit to do Caesarean section presumably knows how to deliver or extract a primiparous breech as an expert; therefore the mortality on primiparous breeches in such hands may be called 10%, as stated by Williams and others. Some of the fetal mortality is due to failure of use, even by trained men, of two procedures, namely bagging the cervix to full dilatation if it does not dilate spontaneously, and deep episiotomy in a tight perineum. Much of the slight additional maternal risk due to the presentation is abolished by these procedures. Also many breeches are lost by a failure to flex the head before attempting to get it down, by not following the mechanism of the after-coming head in the flat pelvis, because an extra pair of trained hands is not scrubbed up, and because suprapubic pressure is not correctly applied. However, admitting the correct performance of these procedures and admitting for the sake of argument that 10% is the lowest mortality obtainable, which is probably not true, shall we submit a woman to a 2.2% immediate risk and a 5% subsequent risk in future Caesareans for the sake of a 10% fetal mortality? I think not. In addition, some primiparous breeches are cephalic monsters which often cannot be previously diag-

nosed on account of the tight wall. By Caesarean these less than desirable additions to a family have the best chance of living, a burden to all. Having subjected a woman to a Caesarean risk for a cephalic monster which lives, we must repeat the Caesarean with somewhat added risk in a future pregnancy with some chance of the same type of offspring. This is a very displeasing prospect. This raises the question of repeated Caesarean after the first, which does not need discussion here, except to say that the majority of the best men believe it wise, and that new evidence is accumulating in its favor all the time. A second Caesarean done recently in Chicago showed the uterine scar made up of half-inch spaces of peritoneum alone—intersected by small bands of muscle; in the opinion of the operator it must certainly have ruptured in labor. It is stated by the author of "Caesarean for Primiparous Breech" that no direct comparison between the fetal head and maternal pelvis can be made in breech presentation. This is true; but by carefully going over the head and pelvis, in the light of previous experience, a working judgment may be formed. Recently a patient with a pelvis 25-20-17-8½, rupturing membranes at the beginning of labor, delivered herself of a 6 lb. 14 oz. baby without perineal tear under gas. This illustrates what I mean: If the baby had been larger, Caesarean would have been considered in this pelvis.

(3) Caesarean Section on the Pelvic Indication. Reynolds and Newell's text-book states that 11-12 cm. is the normal diagonal conjugate. The true conjugate varies with the individual estimate and depends on the width and thickness of the symphysis and inclination of the pelvis; roughly it is from 3½-4 in., or 9½-10½ cm. Less than 3½ in. is a relative pelvic indication. It has been shown that many babies will be delivered safely or deliver themselves with minor degrees of pelvic contraction, and the decision for or against Caesarean rests on the size of the baby, and whether or not the presenting part can be put into the pelvis with or without an anesthetic, or whether or not it overrides the symphysis if it cannot be put in, and sometimes on what it will do under test of labor. We now come to a series of Caesareans done on minor degrees of pelvic contraction in cases with a disastrous previous delivery for the baby. As the cases are reported no attempt was made, either with or without an anesthetic, to determine the above points, nor were the cases allowed any test of labor. When we think of the general standard of obstetrics it seems unfair to subject a woman to Caesarean purely on her history. We have all seen cases, giving a history of and showing results of a previous hard operative delivery, deliver a second baby before the physician's arrival. The other day a woman with a flat pelvis, D.C. 10, who objected to an early anesthetic and in whom the fetal head could not be

put into the pelvis without, and seemed slightly to override, with a history of forceps delivery, the baby dying soon after birth, and the present baby estimated at 8 lbs., took in labor and when seen two hours afterwards, had the head well in the pelvis and nearly full dilatation: she came to easy low forceps. All things were previously prepared for Caesarean. This illustrates what I mean in this type of case.

(4) Caesarean has been done for other reasons, as follows:—

(a) After attempted high forceps in which the head could not be made to enter the superior strait. This may or may not be an indication. Successful difficult high forceps operations require a type of axis traction equipment which will make real axis traction. J. Whitridge Williams in his discussion of axis traction has pointed out once and for all that true axis traction can be made only with a rod and handle of the Tarnier type, that is a straight drop rod for the handle which falls below the anus, because the axis of the superior strait prolonged carries out through the tip of the sacrum. Irving has recently shown forceps of this type, superior to the Tarnier, but possessing this necessary feature. Most operators hereabouts use forceps with absolutely straight rods; they are powerful instruments but obviously do not make complete axis traction. Perhaps this accounts for some of the cases in which Caesarean is done when high forceps fails.

(b) Caesarean has been done for prolapsed cord in a young primipara, $\frac{3}{4}$ dilated, transverse, with true conjugate $3\frac{1}{4}$ in. and "fair sized baby." She had been examined by another physician. Why was Caesarean done? It is hard to see from the report.

(c) Caesarean has been done in a young primipara, true conjugate $3\frac{1}{4}$, fully dilated, transverse, arm prolapsed, membranes ruptured 5 hours, no mention of condition of uterus. No mention of baby. Why was Caesarean done? Certainly a fillet to the arm would have rendered version and extraction easier than otherwise, and bringing an arm up from the vagina with five hours ruptured membranes increased the risk of Caesarean.

(d) Caesarean has been done in the following case: Cervix not fully dilated after seven hours, with presenting arm, true conjugate $3\frac{1}{4}$, weight of baby not given, stated to be of large size; and for several other conditions; twins with first transverse and prolapsed arm; an intramural fibroid size of hen's egg, which made engagement questionable. No attempt to engage it is recorded.

All the above cases made absolute recoveries. Therein lies the danger. They will be repeated until maternal death occurs. The indication is not clear in any from the report.

(5) Caesarean in Toxemia of Pregnancy.

(a) Toxemia without convulsions. (b) Eclampsia.

(a) To take a toxemic patient without convulsions and subject her to a laparotomy, putting out of commission for some hours at least and sometimes days, our major practical eliminative channel—the bowel—and throwing added strain on the kidneys as well, seems irrational when we can bag the patient and eliminate at the same time labor is progressing, or in favorable and urgent cases, do vaginal Caesarean without putting the bowel out of action. It will be argued for this theory that it is more important immediately to get rid of the source of the toxin, i.e. the contents of the uterus, than to preserve the means of elimination of the accumulated toxin; but in practice it is to be remembered (1) that only a very small proportion of toxemias become eclampsies, if emptied by bagging on progressive symptoms; (2) that post partum eclampsia occurs sometimes as late as the seventh day, that it occurs especially if elimination is neglected; (3) that usually, though not invariably, the outcome of a toxemic case depends on whether or not it eliminates. Prognostically, if the bowels move the patient usually gets well. It may be that this is putting the cart before the horse, that toxemias who die do not eliminate because they are profoundly toxemic; but from either point of view elimination by the bowel is the most important single feature of a case.

(b) Eclampsia. The same argument holds good in eclampsies more strongly. Since they are more toxic it is still more important that they eliminate, hence Caesarean is unwise; since they are highly susceptible to shock, rapid instrumental and prolonged difficult manual dilatation is unwise; rapid vaginal Caesarean in suitable cases or bagging with traction is the method of delivery, controlling the fits with morphine and eliminating all the while. According to J. T. Williams, the maternal mortality is 48.2% in Caesarean for eclampsia, dilatation of the cervix 7% to 26%, and vaginal Caesarean 3% to 18%. I think consistently doing vaginal Caesarean on early and suitable cases, bagging with traction on cases with tight os not suitable for vaginal Caesarean and manual dilatation and delivery of those very readily dilatable will give better statistics than the above. An operator preparing to deliver a toxemic or eclamptic should have in his boiled outfit suitable instruments for these three mentioned procedures.

Peterson, among others, in a large number of cases has shown that emptying the uterus as soon as possible is the wisest treatment of eclampsia and toxemia. This corresponds with the theory of disease. The reason Caesarean has appealed is because it is so rapid, it superseded naturally enough the rapid divulsing of the rigid cervix with its high primary mortality from shock and lacerations with sepsis and rupture, and is undoubtedly less risky in cases with

tight os. Vaginal Caesarean is unfamiliar and suitable only to cases in which the cervix can be pulled down and the baby is not too large; bagging with traction is considered too slow, requires sometimes an extra anesthesia from which the patient emerges undelivered, is not pleasant for the patient, requires time and constant attention, and infection is feared; hence it has not appealed. As a matter of fact it is more or less puttering and does take the physician's time, but such cases do anyway; it is not over pleasant for the patient, but it carries no greater risk of infection than any other cleanly done procedure; it is often surprisingly rapid, and it carries a margin of safety over division of the tight cervix and abdominal section. For reasons stated above it deserves far more consideration than has been given it. The greater safety compensates for its added time. One of the chief objections is that the stem of the bag frequently pulls off, but this will be remedied soon by making a bag reinforced at the junction of the stem and dilating portion.

Many Caesareans are done for toxemias and eclampsies. It is commonly stated by those who oppose Caesarean section for eclampsies that it should be done only when there is a pelvic indication in addition. I would go further than this and state that we should take longer chances on the pelvic indication than as though the patient did not have toxemia or eclampsia, and only do Caesarian in an absolute pelvis; first because the patient is more likely to die if we do Caesarean than if we do not, and a live baby and a dead mother is a poor combination, much poorer than a live mother with prospects and a dead baby; second because toxemic babies are notoriously likely to die,—in which case we may have lost both patients. To do Caesarean on an eclamptic or toxemic is to overrisk the mother for less than normal chance of a "going-to-live" baby. Therefore it seems logical to take more chances with the eclamptic or toxemic mother's pelvis than as though she were not toxemic, hoping, if it is a border-line, that the baby will be moulded down; if it isn't, high forceps, pubiotomy or craniotomy are fairer, the cervix being fully dilated by a bag. In a disease carrying the mortality of eclampsia, a live mother with prospects of more babies is enough to satisfy the most exacting. If a live baby is obtained so much the better; but consideration for a toxemic or eclamptic baby should not be allowed to increase the already great maternal risk.

(6) Caesarean for Breaking or Broken Cardiacs. This is a procedure with high recommendation back of it, yet it does not seem logical. True, it removes all strains of labor, and so is perhaps applicable to cardiac cases still in good shape but near the danger line, or in cases which have broken and under appropriate treatment have come back; but in broken cases it adds the strain of distention, persisting often for some days if the patient does not succumb. A

broken compensation cardiac, especially a *primipara*, is a difficult case at best and statistics as yet do not show enough to state absolutely that Caesarean is contraindicated: the future will show; but these cases are even more prone to extreme distention than ordinary Caesareans, which in themselves, are very prone to have troublesome distention, and between the constant effort to relieve gas pressure and the gas pressure itself these cases may well die in the first few days of the puerperium of exhaustion. A certainly fairly definite percentage of Caesareans, too, get acute dilatation of the stomach; a broken cardiac developing acute gastric dilatation would be a bad risk. Also in Caesarean the intra-abdominal pressure is altered somewhat more rapidly than in delivery from below; this is theoretical but may deserve some consideration in the matter. The first stage of labor, especially under a narcotic, as morphine-scopolamine anesthesia with oxygen occasionally administered, takes little out of a cardiac, and the second may be handled with ether-oxygen narcosis from an ordinary Flagg portable gas-ether machine and forceps to prevent strain. It is a fact that many cardiacs dilate and even deliver with exceptional rapidity. Vaginal Caesarean with morphine-ether oxygen anesthesia seems the choice where induction is necessary and the case favorable; bagging when not.

(7) Caesarean Section Performed Any Time in Labor and under All Conditions. Within the last month two Caesareans were performed hereabouts in hospital under the following conditions: (1) Patient in labor 24 hours, membranes ruptured some hours, repeated vaginals and attempted forceps outside. Brought to hospital, uterus in tetanic contraction, membranes ruptured, enormous caput filling vagina, baby alive. Caesarean was done, a live baby obtained, mother ran a slight febrile convalescence and went home in good condition. (2) The other,—“twilight sleep” for 24 hours in a hospital; at the end of that time Caesarean was done for “insufficient progress.” On the fourth day temperature 103, pulse 130. Outcome not known.

The results of these operations do not alter the facts that the operators took too great risks, greater risks to somebody else than anybody has a right to take; and if they know enough to do Caesareans they know enough to know this. J. Whitridge Williams' recent article on Pubiotomy, written after a good many years' experience with it, and with a field narrowed by this experience, shows it to be the operation of choice on late, neglected or misjudged border-line cases, at least where a living baby is demanded; and craniotomy on a living child, especially when it stands a chance of intracranial hemorrhage or ultimate death from exhaustion, is indicated as against late and probably infected Caesarean.

(8) Caesarean Section by General Surgeons

Untrained in Obstetrics. Many surgeons hereabouts who profess themselves unable to apply low forceps, and those who are untrained in obstetrics but do not profess it, do Caesarean section, presumably under the orders of general practitioners whose professional judgment and care is not sufficient to tell them in advance in a reasonable number of cases what will be demanded at time of labor. One naturally questions on what and by whom is the decision made. And one is forced to the answers: "Because the baby does not come," and "By two men equally incompetent to decide." This may seem extreme; but when we have the surgeon operator, often professedly ignorant of obstetrics, and we hear from teachers throughout the country the deplorable condition of general obstetrical practice, it may not seem unfair. It may be and probably is true that it is safer for the average general surgeon to cut the baby out through the abdomen than to attempt to deliver from below, but why should a surgeon set up to do consulting obstetrics in one breath and be proud that he doesn't know how to use forceps in the next? Any good surgeon may be a good obstetrician as well, may indeed be a good obstetrical consultant, if trained and doing enough obstetrics to keep his hand in; that sort of man is not here referred to. The sort of man I do speak of is among us adding to the number of unnecessary and dangerous Caesareans.

(9) Caesarean section has perhaps in some instances been done for personal advertisement or for commercial reasons on account of the poor fee for poor work that is often paid for ordinary deliveries. These instances are rare, however, and since they occur in that small proportion of the profession who have sunk medicine in all its branches to the level of "make" require no comment here.

In conclusion, three matters present themselves in connection with this subject: (1) The old attitude of many general men toward Caesarean section persists—they still believe it is the saving operation of last resort. They have this idea so firmly fixed that in private hospitals they will hunt until they find some one who will do Caesarean in late cases; while in public hospital cases they are frequently abusive when it is not done on their patients. (2) It is usually stated that the mortality on Caesarean babies is zero. It is not zero actually even if it is theoretically. I know of two macerated fetuses where the fetal heart was said to have been heard before operation; 2 babies died of "atelectasis" in some 75 Caesareans at the Boston Lying-in; occasionally a baby dies of prematurity, of congenital heart; monstrosities occur; toxemic babies die sometimes and so on. When figuring mortality in Caesarean babies from the practical point of view of the family you are forced to figure in mistakes in hearing, inexcusable if you like, but occurring, and in estimation of size and dates, and all other causes of death in the first two weeks of life except those

due to birth injuries. He who promises a normal live baby for every Caesarean, and this is being done as an argument for them, if he does enough will break his promise. (3) It is stated by men with good Caesarean experience that their patients are all well afterwards. This has not been my experience in the limited number I have seen after operation, nor is it possible to feel quite as optimistic in general in this regard as the men referred to, because we know that a certain number of laparotomies, especially women, are constantly aware of the operation either from scar pain, adhesions, bowel irregularity or "nervous knowledge." We know from secondary Caesareans that adhesions are the rule, though usually omental and benign; from examination that the uterus sometimes remains adherent to the lower margin of even the high incision,—a manifestly distorted position. The high incision has decreased the probability of hernia quoted from DeLee above.

The purpose of this paper is not to cover Caesarean section. It is not to bring forward a statistical argument against it. It is, above all, not to belittle its honest value. It is written because a good thing exploited is apt to go bad.

"Interesting and valuable in connection with this subject is 'Obstetrics a Lost Art,' Rudolph W. Holmer, Chicago, *Surg., Gyn. and Obstet.*, Nov., 1915. The present paper was in the publishers hands about six weeks prior to the above publication."

ANAESTHESIA IN OBSTETRICS.*

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JUSTIFICATION for alleviating pain in labor lies in the degree of surety against harmful results, or in the preponderance of benefit to be derived over the risk of possible harm. There is no appeal to those who take pride and believe in the practice of obstetrics as an ART, in the policy of "letting nature take its course." Newell, DeLee, and others have pointed out that labor in the woman of present-day civilization has ceased to be physiological. Pregnancy has not inaptly been called a disease of nine months' duration. We might add that the disease is always terminated by a surgical procedure, namely, labor. The dangers of shock, hemorrhage, and infection behoove the accoucheur to bring his patient through labor in as good condition as possible. It is incumbent on him, on the other hand, not to add to these dangers by ill-advised procedures.

It is the purpose of this paper to enumerate the various agents at our disposal for anesthesia in obstetrical cases, and from a recounting of their scientific actions to deduce theoretically their indications and contra-indications.

* Read at the fifty-first monthly meeting of the Chirurgical Society of Boston, November 26, 1915.

But first let us inquire into the subject of labor pains and their mechanism, nervous and otherwise.

Painless labor is abnormal. Women, however, vary so greatly in degree of pain felt and ability to stand pain, that "clinical evidence" of success of any method of analgesia in a given case is unreliable.

There are several points to be noted about uterine pains. They are involuntary and yet may be influenced by higher nervous disturbances; for they may be inhibited or augmented by mental states or nervous shock. Perfect spreading of the contraction over the whole of the uterus apparently under certain conditions, may be easily interfered with, resulting in a contraction ring.

Normal pains are intermittent contractions, followed by relaxations. This mechanism may go wrong with formation of tetanic contraction.

Rhythmic contraction develops in a longer stage of increasing intensity to the apex, and then subsides gradually. The subjective pain does not commence until the contraction is well advanced. Therefore the beginning of a pain must be detected objectively, by the palpating hand on the abdomen.

As has been said, both actual suffering and ability to stand suffering vary in women. That the process of labor is painful goes without saying. Not only the process, but the resulting bruises and wounds must be painful in their production. The alleviation of pain in labor, if attended by a degree of proportionate safety, offers a strong appeal, if only to the humanitarian instinct. If, however, it can be shown that the relief of pain makes labor safer, it becomes the duty of the attending obstetrician to institute such procedure, following indications carefully and closely.

Little is known of the exact nervous mechanism of labor contractions. I quote from De-Lee. A nerve centre "is believed to exist in the cortex, one in the medulla, in the cerebellum, and in the lumbar enlargement of the cord, because irritation at these points causes uterine contractions. There is an independent nerve centre in the uterus because the organ acts when removed from the body."

That the higher centers may affect uterine contractions is evidenced by either inhibitory or accelerator influences on labor by mental or emotional activity. That the brain is not necessary to the nervous mechanism is evidenced by the smooth (and painless) progress of labor possible in patients with transverse lesions of the cord. Afferent sensory impulses are transmitted from the cervix, as evidenced by pain. That a reflex centre in the cord is thus stimulated and an afferent impulse sent back is evidenced by the contraction of the cervix against forcible dilatation. That the reflex cord nervous mechanism is not absolutely essential to labor is presumed from the contraction of the isolated uterus and from the non-interference with

rhythmic uterine contractions under bromides, chloral, and light ether.

Sympathetic stimulation, as in the intestine, is depressor or inhibitory to contraction.

The uterine muscle during pregnancy develops an increasing tone or capability of contraction. That the stimulus for contraction comes from the distention of the organ by its contents, as in the case of the stomach, is reasonable to suppose. That this stimulus is acting throughout pregnancy explains the contractions that are known to occur, even in the early months. The precise reason for these contractions taking on force enough to expel the fetus, the actual cause of the onset of miscarriage, premature, or labor at term, is not clear. Whether it be an increase of carbon dioxide, an active hormone, or a lack of an anti-body in the blood; whether it be decidua changes, the passing of the fetus from a part of the maternal organism in effect, to the rôle of a foreign body; whether it be the reaction due to the increase of tonicity or irritability of the uterine muscle beyond a certain point; whether it is one of these or a combination is not known. Uterine contractions take place all through pregnancy, increase in frequency and intensity toward the end, are sometimes felt as false labor pains (generally by multiparae, the same individuals who suffer from after-pains), and finally become true labor contractions, regular in frequency, and productive of work in taking up or dilating the cervix.

In summing up the following points are important:

1. The primary stimulus for uterine contraction is in the uterus itself.
2. Depressor stimuli come from the sympathetic, inhibiting tone, as in the stomach.
3. Stimuli productive of uterine tone come from the cord and are important to proper contractions. (Analogous to vagal stimuli in the action of the stomach.)
4. Reflex motor stimuli come from the cord, retard the first stage of labor through spastic resistance to dilatation, but are important after labor to prevent hemorrhage.

If reflex spasm of the soft parts can be inhibited, theoretically labor will be shortened, for dilatation will more readily take place. Individual labors vary so in length of time that it is hard to prove this contention. The most that can be said is that clinically this theory seems to work out. It must be remembered that spastic contraction of the uterus after labor is of great advantage rather than a hindrance. Therefore the effects of cord-depressing drugs should have worn off by this time, that not only tone-producing but also reflex motor stimuli may be active.

We have then three problems in the conduction of labor under anesthetic agents: first, the alleviation of subjective pain; second, the inhibition of excessive reflex spasm; third, the removal of sympathetic depressor impulses.

Before taking up drug anesthetic agents, it may not be amiss to call attention to the rôle played by the nervous and mental condition of the patient in the process of labor. Hyperexcitability, exaggerated reflexes, augmentation of neurasthenic or hysteric taint are recognized as part of the pregnant state. The question might be raised as to how much fear, worry, etc., by excessive sympathetic stimulation, have to do with inertias and unsatisfactory labors, so frequent among finely and nervously wrought women. Suggestion, consciously or unconsciously, is used universally, and the benefits of the sympathy and encouragement of the physician are well recognized, but we wish to point out the distinct advantage to the patient in labor of a confidence in the obstetrician (engaged early in pregnancy); this confidence earned by the physician as a result of close supervision and solicitous interest in the handling of the antepartum period. It is reasonable to suppose that such hygiene of the nervous system obviates reduction of uterine tone from over-sympathetic stimulation.

Action on.	Pain.	Brain.	Card Centre.	Resp. Centre.	Vasomotor Centre.	Heart.	Blood Pressure.	Sympathetic Nerve Endings.	Uterine Muscle.
Bromides	—	—	—	—	—	—	—	—	—
Chloral	—	—	—	0	—	—	—	—	—
Scopolamine	—	—	—	—	—	—	—	—	—
Morphia	—	—	+	—	0	—	0	—	—
Heroin	—	—	+	—	0	—	0	—	—
Ether	—	—	—	—	—	—	—	—	—
Chloroform	—	—	—	—	—	—	—	—	—
Nitrous ox.	—	—	—	—	—	—	with asphyxia	+	+
Spinal anesthesia	—	—	—	—	—	—	—	—	—
Nerve Block	—	—	—	—	—	—	—	—	—

The Antipyretics. Quinine has a depressant action (after a short stimulation) on the central nervous system. Its action on muscle is the same. It has been advised as an ebolic rather than as an analgesic agent in obstetrics, and need not be discussed here except to say that to many obstetricians, favorable clinical results are wanting following its use.

The synthetic antipyretics are slightly depressant to nerve centers, but not efficient for pain, except of neuralgic type. Antipyrin in large doses has been said to have been used with success, but such use would seem to be contraindicated by dangers from poisoning.

Bromides. The bromides depress spinal reflexes, especially the connection between sensory and motor cell. They are of value to the obstetrician. When borne by the stomach or administered per rectum they aid greatly in relieving the vomiting of pregnancy, "pressure pains," and sleeplessness toward the end of pregnancy and in general in "taking the edge off the patient's nerves." They would seem to

be indicated at the beginning of labor; at the beginning because of their slow action, in one large dose. The indication in theory is to inhibit the spinal reflex, allowing labor more rapid progress. Their action is not strong in the presence of pain, but may be used as an adjuvant in combination with other drugs. Bromides, for temporary action, are safe, with no marked effect on other organs. Contraindications for their use are need of rapid action, fear of kidney irritation from the elimination of the salt, and sensitive stomach if administered per os.

Chloral. The action of chloral is depressant to brain and spinal cord. It does not depress the respiratory centre as morphia. There is a depression of blood pressure and of the vaso-motor centre under its use. It has a depressive action on the heart and the blood vessel walls like chloroform. Sulphonal and veronal have less action on the heart, but are destructive to the hemoglobin.

The beneficial action of chloral in labor is universally known. It works by reducing pain and the cord reflexes. The result of its use, the "softening of the cervix" as described by some authorities, is the inhibition of the spinal reflex, productive of spasticity. The dangers from its use come from its depressant action on the vaso-motor centre and the heart. The subsequent falling blood pressure might be advantageous in toxemic cases, but is offset by its irritant effect on the kidneys.

Scopolamine (Hyoscine). Scopolamine is in the atropine group, and resembles that drug in its peripheral action. It is said to act five times as strongly on the sympathetic nerve terminations. It does not stimulate the central nervous system as does atropine. It does not stimulate the vaso-motor or respiratory centers. It produces sleep by depression of the central nervous system, especially the brain. Reflex irritability is depressed by the drug. Scopolamine is indicated for obstetrical anesthesia because of its:

1. Depressant effect on the brain; as an adjuvant to the effect of morphia in controlling subjective pain.
2. Depressant effect on spinal reflex irritability, tending to decrease reflex spasm of cervix and soft parts, thus allowing more rapid labor.
3. Paralyzing effect on sympathetic nerve terminations in the uterus, thus removing depressant sympathetic influence. The contraindications will be taken up under the discussion of the combined use with morphia.

Morphia. Morphia is a depressant to the great psychical functions. It is specific for subjective pain. It has no effect on the circulation. In large doses it is a stimulant to the cord, except the respiratory centre. It depresses respiration. It has been claimed that morphia in small repeated doses has a depressant action on the smooth muscle of the intestine; this conclusion explains the constipating effect of the drug.

Most men are afraid to administer morphia after labor on account of "relaxing the uterus." If morphia has such an effect it must be due to direct action on the muscle, for the cord is not depressed.

The depressive muscle action being problematical, in uterine hemorrhage the relief of restlessness by morphia has always seemed of over-balancing benefit.

Incidentally, specific cord stimulation by a large dose of strychnia has always seemed clinically to the author to be the most effective treatment in producing tone in a poorly acting uterus postpartum.

Ether and Chloroform. These drugs produce a progressive paralysis of the nervous system, beginning with the brain and extending to the cord, and last affecting the medulla. They lessen uterine contraction. Chloroform is more pleasant and quick in action, and less amount is required. It is three times as depressant to the nervous system and forty times as depressant to the heart as ether. Chloroform is contraindicated when fatty changes are present in the heart. They are both kidney irritants and contraindicated in renal disease. Both are said to lower the resistance to infection.

Ether being the safer, is the anesthetic of choice of most surgeons. The use of chloroform by well-experienced hands is not contraindicated when its advantages over ether are desired, and heart and kidney disease, etc., are ruled out. "Obstetrical ether" works beautifully at times, its efficiency generally being in proportion to the skill of the administrator and the tractability of the patient. The writer personally is in favor of substitution of forceps for the second stage of labor at the election of the patient and in the hands of the trained obstetrician. With any method of analgesia it must be remembered that the second stage will be prolonged to the extent with which voluntary efforts of the patient are inhibited. Also with general anesthesia, for delivery, the importance must be borne in mind of carrying patient as "light as possible" at the time of delivery, and thereafter to remove spinal depression and promote uterine tone.

Morphia and Scopolamine. The combination of these drugs would seem to be a happy one when the therapeutic effect is analyzed. They help each other in controlling subjective pain. It takes large doses of morphia to elicit the cord-stimulating effect of the drug, so that the cord-depressing influence of the scopolamine is probably predominant in obstetrical doses. The selective action of the latter drug on the sympathetic nerve endings produces an effect greatly to be desired, viz: the acceleration of labor by the removal of depressor sympathetic stimuli.

Contra-indications. It is certainly logical, therapeutically, that morphia-scopolamine anesthesia cannot be pushed to the extent of rendering birth pains, or even ordinary second-stage pains, free from discomfort without having

enough morphia in the baby's circulation to materially depress the respiratory centre. In fact, narcosis and asphyxia of the child have clinically been a constant bad result reported by those attempting painless delivery under this combination of drugs.

It has been pointed out that tone-producing and even reflex motor stimuli from the cord are important after delivery, to prevent hemorrhage. If scopolamine is pushed to the time of delivery it is logical to expect relaxation of the uterus postpartum through depression of the cord. And postpartum hemorrhage has been another of the bad clinical results reported from this use of scopolamine.

Prolonged second stage has also been reported as a common result of carrying morphia and scopolamine anesthesia to delivery. This would seem a reasonable effect from interference with voluntary efforts on the part of the patient. It is evident that morphia narcosis of the fetus is not dangerous as long as the maternal blood supply furnishes the respiratory function. Also that depression of the cord to a certain degree is desirable in the first stage.

Idiosyncrasy to these drugs with delirium, etc., is, of course, a contraindication to their use. It is our conclusion that the conduction of the second stage of labor and delivery under morphia and scopolamine anesthesia is contraindicated. Furthermore, the administration of these drugs should be stopped three to five hours before expected delivery, according to the amount that has been given.

Nitrous Oxide. The action of nitrous oxide is depressant to the central nervous system, just as chloroform and ether. Rising blood pressure may occur, due to asphyxial condition of the blood.

Nitrous oxide is the safest anesthetic known. Contraindications to its use exist only when administered to any asphyxial degree.

"Carbonization" of the maternal blood is injurious to the fetus. With cyanosis a rise in blood pressure may result, which contraindicates its use as a general anesthetic in toxemic cases. "Obstetrical gas" is so safe and so easy of administration that it should appeal strongly to the general practitioner. This subject is ably covered in a communication from Dr. Paine, which will be published in *Surgery, Gynecology and Obstetrics*. I refer the reader to this article for description of technic.

Dr. Paine calls attention to the clinical increase in force of uterine contractions under gas analgesia, and suggests this effect is due to oxytocic properties.

I am rather opposed to the use of an oxygen-and-ether-added-apparatus, for it gives a temptation to the administration of too deep states of nitrous oxide. These deeper states would more safely be secured with straight ether. I am opposed to gas-ether sequence, not only on account of the possible injury to the baby from cyanosis.

but also on account of shock to the mother from rapid ether absorption.

Cocaine. The cocaineization of the cervix through a long labor presents dangers of absorption too great to recommend its use. Routine blocking of the pudic nerves or spinal cord presents difficulties in technic and dangers from infection too great to render the practice advisable. However, we wish to go on record as favoring spinal anesthesia as the anesthetic of choice in obstetrical operations, either from above or below, in threatened or eclamptic cases, for three reasons:—

1. Avoidance of kidney irritation.
2. Fall in blood pressure.
3. The blocking of impulses from the field of operation, which might be the exciting cause of convulsions.

In conclusion it would seem apparent that no method of anesthesia is safe through the whole of labor. The varying indications and contra-indications must be followed carefully and closely, with the safety of both mother and child in mind. For long, primiparous labors the following sequence would seem to be best: The proper use of bromides, chloral, or morphia-scopolamine in the first stage; the administration of these drugs to be stopped in time so that their effects shall have worn off by the time of expected delivery; nitrous oxide administration during pains according to technic described in Dr. Paine's communication, with or without the change to obstetrical ether for delivery; or, in the hands of the trained obstetrician, the substitution of forceps for the second stage, under sufficient ether anesthesia.

NITROUS OXIDE IN OBSTETRICS.

BY FREDERICK C. IRVING, M.D., BOSTON.

THE distinction of having first used a combination of nitrous oxide and oxygen to abolish the pains of childbirth belongs to Klinkowitch of Petrograd, who published his results in 1880. Beginning when the os was two fingers dilated, he administered 80 parts of nitrous oxide and 20 parts of oxygen to 25 patients. He gave only enough to alleviate or abolish the pain without producing anesthesia. His results were so gratifying that it is difficult to see why his work has never been repeated until recent years, especially since it is well known that dental surgeons have long used a similar combination of the two gases with complete success. To demonstrate that under this method labor pains were not weaker, shorter or less frequent than normal, Klinkowitch inserted an elastic bag into the cervix, filled it with water, connected it with a manometer and kymograph by means of a pipe line, and made graphic records of the uterine contractions.

He concluded that the efficiency of labor was not diminished, but, if anything, increased. His impressions regarding success in the relief of suffering, immediate safety for both mother and infant, and the absence of untoward after-effects are in exact accord with those of recent investigators.

Tietel in 1883 and Doederlein in 1886 gave gas and oxygen to the surgical degree in operative obstetrics. For the past ten years J. C. Webster of Chicago has been using it in a like manner, and occasionally, given to complete narcosis, during the expulsive stage only of normal delivery. In 1911, Guedel of Indianapolis reported in detail five cases in which he had given nitrous oxide and air as an analgesic during labor, and described a small portable machine for its use. Lynch in 1913, Webster in 1914, and Lynch, Webster, Heaney, Buchanan, Skeel, Davis and Luther during the past year, have all made contributions to the literature.

Pharmacology of Nitrous Oxide Alone, and Combined with Oxygen. Nitrous oxide alone is a specific anesthetic and exercises an individual action upon the brain cells. Its anesthetic property formerly was thought due to asphyxia. That this is not true is shown by the addition of oxygen, which eliminates asphyxia, and yet does not impair its virtue as an anesthetic. It exercises no destructive effect upon the plasma or corpuscles, and is carried merely as a physical solution. Blood pressure is always raised by nitrous oxide alone. With a judicious admixture of oxygen, however, this change is slight. No effect is exerted upon the liver or kidneys, and it is eliminated solely by the lungs. There is no irritation of the air passages. Nausea and vomiting are not due to any inherent property of the gas, but, when present, always suggest faulty administration. The lessened amount of tissue change under nitrous oxide anesthesia connotes a smaller amount of carbon dioxide given off by the body. By the employment of rebreathing, a further conservation of CO_2 is effected, thus aiding in the prevention of shock, according to the theory of Yandell Henderson.

When nitrous oxide alone is given, the patient passes from consciousness to full anesthesia in from 30 to 60 seconds. Any attempt to divide this brief period into stages of anesthesia is manifestly impossible. Mixed with oxygen, however, a more leisurely method of induction is permitted and four stages are distinguished:

1. The stage of analgesia. The patient first experiences a sensation of warmth in the lips, followed by numbness in the extremities and a feeling of exhilaration. In the first part of this period sensation is more acute; in the latter part the patient is analgesic, and it is in this condition that the operator aims to keep his obstetric patient when he is giving the gas for the relief of pain. If the concentration of nitrous oxide is now raised the patient passes into the

2, or stage of excitement. This period begins with the loss of consciousness. Incoherent thoughts and words and purposeless muscular movements are apt to occur. No surgical procedure should be attempted during this stage, for although the patient will neither suffer pain nor retain the memory of it, any rough manipulation will serve only to intensify the excitement.

3. The stage of surgical anesthesia is attained in from one to four minutes. Breathing should be automatic and regular. The lid and other reflexes are abolished and relaxation is more or less complete.

4. The stage of overdose manifests itself by increasing lividity accompanied by excessive breathing. Dyspnea succeeds, followed by convulsive expiratory efforts, which gradually become weaker until death supervenes.

Rapidity of Elimination. Kemp ascertained that the concentration of nitrous oxide in the blood fell in less than two minutes from over 20% to 6.9%.

Safety. Gwathmey states that in suitable cases, combined with oxygen, it is the safest anesthetic there is. The mortality is generally placed at 1 in 50,000.

Contraindications. It should not be given to the very old, the very young, or the debilitated. Patients with arteriosclerosis, valvular disease of the heart or a high blood pressure should take some other anesthetic.

Full surgical anesthesia can be maintained indefinitely with nitrous oxide and oxygen, but not with nitrous oxide and air. It requires 8% oxygen to prevent spasm and cyanosis. Only 1.5 of atmospheric air is composed of oxygen; the remainder is nitrogen. Therefore it requires 5×8 , or 40%, air to supply the necessary 8% oxygen. This 40% of air would so dilute the nitrous oxide that continued anesthesia would be impossible. It is evident, however, that analgesia, which occurs during the latter part of the first stage of administration and requires a smaller concentration of nitrous oxide, may readily be maintained for so short a time as the duration of a labor pain by the simple admixture of enough air to prevent cyanosis.

The method used by the writer does not differ essentially from any hitherto published. For the first few cases a nasal inhaler, as recommended by Lynch, Webster, Heaney and Buchanan, was used, but it was found difficult to prevent mouth breathing during the birth of the presenting part, when full anesthesia is desirable. Since then a surgical mask has been used with perfect satisfaction. Whenever labor is well advanced and the patient considers her sufferings too great to be borne, the administration is started. The machine, a very simple one, previously has been explained to her and she has been allowed to breathe air through it to assure her that she will not be suffocated. The rubber collar about the rim of the mask has been

inflated with the smallest possible amount of air necessary to make it fit the patient's face. The writer has seen gas administration a failure because this collar has been so tightly blown up that it left a space below the malar eminences and admitted so much air that neither analgesia nor anesthesia was possible. The bag is filled with nitrous oxide and the patient holds the inhaler in her hands. Just as soon as a pain begins she places it over her face and closes the air valve, which at the same time admits gas to the mask. She takes five or six deep breaths which she re-breathes into the bag and continues breathing nitrous oxide until she feels herself going to sleep when she releases the air valve, thus shutting off the gas. Should any painful sensation return, she again closes it and proceeds as at first. This places the regulation of analgesia in her hands. After eight or ten breaths have been taken the operator admits a small amount of oxygen to prolong the analgesia, and prevent cyanosis. The exact percentage of oxygen is of no importance, and the anesthetist determines by questioning the patient the amount necessary to achieve the desired result. If the pains become too severe to be controlled by this method, the expiratory valve is opened and the patient receives fresh nitrous oxide with every breath. The relief is so grateful that after a severe pain which has required a strong concentration of gas for its control, she is apt to lapse into unconsciousness. This is rather a pleasant experience than otherwise, and is infinitely better than allowing her to suffer because the anesthetist is afraid she will go to sleep. It is impossible for her to become very deeply anesthetized at this stage because the inhaler will fall from her hands before such a condition of affairs can happen.

Essentials of a Gas Machine Suitable for Obstetric Work. (1) It must be so small and light that it may be transported and used anywhere. Most "portable" machines on the market are only slightly less stationary than those designed for hospital use. (2) It must be so simple that it will not readily get out of order. (3) There should be a device for the addition of ether, should the obstetrician wish to use this anesthetic for an operative delivery.

Results. Lynch has used nitrous oxide and oxygen for over 1 hour in 34 cases, over 2 hours in 32 cases, over 3 hours in 12 cases, over 4 hours in 4 cases and in 1 case over 6 hours.

The writer has employed this method of analgesia in 34 cases; 24 were primiparae and 10 multiparae. 7 received it for less than 1 hour, 9 for more than 1 hour, 13 for more than 2 hours, 4 for more than 3 hours and 1 for more than 5 hours. 32 patients had complete relief from pain from the moment the gas was started. They all stated that they could feel the uterine contractions, but that they were painless. Two patients had imperfect analgesia toward the end of labor. Probably the gas was not started at the

very beginning of the uterine contractions or it was not given in sufficient concentration. There was no undue post-partum bleeding or untoward effect of any kind upon either mothers or infants. Three babies were born dead; two of them were macerated fetuses and one was a monster still-born at seven months. All others cried promptly at birth and none required resuscitation. From the standpoint of both patients and obstetrician, the results were most satisfactory.

Cost. Webster and Lynch place the cost at from four to five dollars per hour, Davis at \$1.50 an hour. Skeel's estimate of from 30 to 50 gallons of nitrous oxide and 15 to 20 gallons of oxygen per hour, is more moderate and more nearly approaches the experience of the writer, who, by the extensive employment of rebreathing, finds that the cost does not exceed seventy-five cents an hour. By the use of large hospital tanks, the expense can be still further reduced.

Other Uses in Obstetrics. One of the most satisfactory points about nitrous oxide and oxygen is the increased freedom with which the obstetrician may make bimanual examinations before or at the beginning of labor, when an attempt is made by the method of Müller and Kerr to fit the presenting part into the pelvis in borderline cases. After some experience with ether used for this purpose, the writer was much surprised at the relaxation obtained under full anesthesia in seven cases where the question of Caesarean section arose. The patient was so little disturbed by this most valuable diagnostic procedure that there can be no possible reason for not employing gas and oxygen in all cases where there is a question of disproportion.

Other obstetric manipulations where this form of anesthesia is valuable are: the introduction of Voorhees bags and of uterine packs; flexion of an extended head or conversion of a posterior to an anterior position; replacement of a retroverted and incarcerated pregnant uterus; removal of an incomplete abortion or the giving of an intrauterine douche.

CONCLUSIONS.

1. Nitrous oxide and oxygen is the most successful analgesic known for the relief of the pains of labor.
2. It is the safest anesthesia there is. It has no untoward effects, immediate or remote, upon either mother or baby.
3. It does not delay labor or in any way impair the efficacy of the uterine contractions.
4. It is pleasant to take, and recovery from it is extremely rapid and usually featureless.
5. It can be administered anywhere and it can be employed by any physician who will take his confinement cases seriously enough to retain a capable assistant for its administration.

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A SECOND STATEMENT REGARDING THE RESPIRATORY MECHANISM IN PNEUMONIA.

BY L. H. NEWBURGH, M.D.¹ J. H. MEANS, M.D.,² AND
 W. T. PORTER, M.D.³

[From the Laboratory of Comparative Physiology in the Harvard Medical School.]

I.

A FORMER communication* presented evidence that in cats with pneumonia the reaction of the respiratory mechanism to carbon dioxide is greatly impaired.

This reaction is also impaired in dogs with pneumonia.

Following are typical examples: Dog No. 9, Nov. 28, was tested 25, 29, 31 and 33 hours after the injection of Friedländer's bacillus into the lung. The last test was 40 minutes before respiratory death. When the carbon dioxide in the inspired air rose to 5%, the increase in the cubic centimetres of air breathed per minute was, respectively, 205, 152, 74 and 37% of the volume breathed per minute in atmospheric air. Normal dogs increase, as an average, 300%.

Three dogs, very ill with pneumonia, breathed atmospheric air at the rate of 5000 c.c. per minute; at 5% of carbon dioxide, they increased the air inspired per minute by 89%. Three normal dogs also breathed 5000 c.c. per minute; at 5% carbon dioxide, the normal dogs increased the air inspired per minute by 220%.

It will be observed that in atmospheric air these pneumonia dogs and these normal dogs breathed the same number of cubic centimetres per minute. Hence the failure of the respiratory mechanism to react cannot be explained by the statement that the pneumonia dogs, part of whose lung could not aerate the blood, were for compensation breathing already so much that they could not increase to meet the increase of

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the carbon dioxide in the inspired air. Additional evidence is as follows: (1) As the disease advances, the carbon dioxide reaction diminishes; so may the initial ventilation (i.e. the volume of air breathed at the beginning of each test). (2) If the failure to react were due to the loss of respiratory space from hepatization of the lung, large consolidations should be accompanied by a large reduction in the carbon dioxide reaction, and small consolidations by small reductions. This is not the case; there is no parallel between the area of consolidation and the amount of the reaction. (3) By injecting starch into the lungs, we have solidified areas as large as those hepatized in bacterial pneumonia, but in these starch pneumonias the carbon dioxide reaction was normal. (4) The impairment of the respiratory mechanism increases progressively, while the area of consolidation may remain unchanged.

II.

The impairment of the respiratory mechanism cannot be due to injury of the respiratory nerve cells by bacterial poisons in the blood. Friedländer's bacillus injected into a vein produces a bacteremia identical with that occurring in pneumonia, but the respiratory mechanism reacts normally.

The impairment cannot be due to products of the pathological process in the lung acting on the respiratory mechanism through the blood. The reaction remained normal when the blood of dogs dying of pneumonia was injected into a healthy dog.

Nor can lack of oxygen explain the failure to react. The portion of the lung not consolidated is usually ample for oxygen needs. Moreover, we have thus far been unable to improve the breathing in pneumonia by the use of oxygen, even under pressure; nor has artificial respiration materially altered the course of the disease.

III.

The following experiments show that the failure of the respiratory mechanism in pneumonia may be prevented by section of the vagus nerves.

Dog No. 51. Friedländer's bacillus was injected into the lungs at 5.30 p.m. March 13. Nineteen hours later both vagi were cut. Twenty-two hours after injection the dog was in complete coma; the rectal temperature was 31°. When the carbon dioxide in the inspired air rose to 3 per cent., the air

inspired per minute was doubled—a wholly normal reaction. Two hours later, the dog died. The middle and lower lobes on the left side and half the middle lobe on the right side showed typical red hepatization.

Dog No. 44. Friedländer's bacillus was injected into the lung at 1 p.m. March 10. At 1 p.m. March 11, the respiration was 154, and the temperature 40°. The dog was tracheotomized and both vagi cut. Two hours later, the temperature had fallen to 38°, and the respiration was 32. At 7 p.m., respiration 16, temperature 35° C. Artificial respiration was now given for ten minutes. At 7.10 p.m. the artificial respiration was stopped and, after a suitable interval, the carbon dioxide reaction was measured. At 3 per cent., the volume of air inspired per minute was doubled—a wholly normal reaction. At 7.55 p.m., the dog died. Autopsy showed the usual hepatization.

In both these experiments, in which the vagus nerves had been cut, the respiratory mechanism gave a normal reaction shortly before death. In our numerous observations, the reaction in animals equally ill, but with intact vagi, has always been much impaired.

Attention is called to the fact that in Dog 44, section of the vagus nerves was followed by a fall in temperature from 40° to normal. We have observed a similar fall in other dogs. In this respect, the experiments of Feb. 10 are significant. On this day, Friedländer's bacillus was injected into the lung in nine dogs. One received 1 c.c.; two received 2 c.c.; two others, 3 c.c.; two, 4 c.c.; and two, 5 c.c. per kilo. Eight of the dogs died in from 30 to 44 hours, the average being 36 hours. One dog recovered. He had received 4 c.c. per kilo, but had been vagotomized 22 hours after infection. At this hour, his temperature was 40° and he seemed very ill. After section of the vagus nerves, he was given artificial respiration. He shortly became quiet and the temperature fell gradually to normal. Forty-eight hours after inoculation he drank water (in our experience a valuable prognostic sign), seemed tired, but otherwise not ill. A few hours later he seemed to have recovered entirely and was, accordingly, killed. Autopsy showed complete hepatization of the right lower lobe.

The cutting of the vagus nerves seemed in this case to affect favorably the course of the disease. A similar impression was gained from the experiment of March 17. Four dogs received 1 c.c. per kilo at 9.30 a.m. The vagus nerves were cut at 4 p.m. Three of the dogs died in less than 24 hours. The fourth dog lived about 60 hours, and perhaps would have lived longer but for an accident. He was found dead with the tracheal

cannula tightly stopped with mucus. In this dog, section of the vagus nerves was followed by a gradual fall in temperature from 41° to normal. The temperature remained normal more than ten hours and then gradually rose to 40° C. The autopsy showed the right lower and right middle lobes grey, not friable, somewhat soft, and on section extruding a greyish sero-purulent thick liquid. A culture from the heart's blood gave a profuse growth in bouillon.

The three dogs in this group who died exhibited the stormy, spasmodic type of vagal breathing, which is frequently fatal even without pneumonia.

The observations here recorded afford positive evidence that vagal section may prevent the depression of the respiratory mechanism in pneumonia and justify the hope that vagal section may favorably affect the course of the disease.

CONCLUSIONS

1. The reaction of the respiratory mechanism to carbon dioxide is greatly diminished in pneumonia.
2. The graver the disease the less is the reaction.
3. The section of the vagus nerves may prevent this depression of the respiratory mechanism.

Medical Progress.

RECENT PROGRESS IN PSYCHIATRY.

BY HENRY R. STEDMAN, M.D., BROOKLINE, MASS.

(Continued from page 432.)

VIOLENT TEMPER AND ITS INHERITANCE.

Davenport⁴ has made a study of 165 family histories of wayward girls in State institutions. This is accompanied by a number of tables and pedigrees, and the following conclusions are arrived at:

1. The tendency of outbursts of temper—"tantrums" in adults—whether more or less periodic or irregular, and whether associated with epilepsy, hysteria, or mania, or not, is inherited as a positive (dominant) trait, typically does not skip a generation, and tends, ordinarily, to reappear, on the average, in half of the children of an affected parent.

2. It would seem to follow from the data here presented that epilepsy, hysteria, and mania are not the causes of the violent tempers frequently accompanying them; the violent outbursts are in no sense the "equivalent" of these various psychoses. Rather the violent outbursts of temper are due, in all these associations, to a factor that causes periodic disturbance (possibly paralysis of the inhibitory mechanism?).

This factor has the greatest effect when acting on a nervous system that is especially liable to show the other psychoses. In other words, "tantrums" are apt to be associated with these various neurotic conditions while they have no necessary connection with them.

PSYCHOSES IN THE RUSSIAN ARMY; ABSENCE OF ALCOHOLIC INSANITY.

Gerver⁵ divides the war psychoses into three classes: To the first belong psychoses arising in persons without any heredity taint, being caused solely by the war environment and violent emotions resulting from battles. To the second class belong psychoses that would develop in ordinary circumstances of peace, but which were prematurely brought on by the war. Here belong dementia precox, manic-depressive insanity, paranoia, paralytic dementia, etc. To the third class belong traumatic psychoses, caused by wounds and contusions. The psychoses of the first category do not differ in any way from the old types, but they may be subdivided into those caused by battles, by trench life, and the rear guard psychoses. Clinically, they belong to the acute mental disorders, amentia and asthenic psychoses. Frequently they develop in the form of neurasthenic insanities. The specific character of war psychoses of all the three classes consists in the peculiar coloring and the character of the hallucinations, illusions, delusions, and the patient's conduct. The contents of the hallucinations and delusions are the experiences of war life. Another feature is depression, followed often by excitement, and confusion of consciousness. The character of the battle (artillery, infantry, bayonet attacks, etc.), the duration of the war life at the front, the course of military events (offensive or defensive, victories or defeats), and the general morale of the army determine the larger or smaller proportion of psychoses that develop. Gerver further claims that in the present campaign, the amount of psychoses is comparatively small, about one per thousand; in the previous wars the rate was two or three per thousand. The main cause of the decreased rate is the total absence of alcoholism. In the Russo-Japanese War, this was responsible for one-third of all the psychoses. In the present campaign there has not occurred a single case of alcoholic insanity.

PRESENILE DEMENTIA.

Benders⁶ has been able to find only two cases in the literature, similar to four he has encountered in the course of a few years. Another case from the records of the Meerenberg asylum in his charge, might be included in the group. This case was in a man, but his own four patients were women in the fifties. In all, there was a rapidly progressive loss of memory, and loss of the faculty of perception. The brain seemed to have lost the faculty of responding to

impressions, especially optic impressions. They paid no attention to anybody or anything, and stayed indefinitely wherever they were placed, never speaking, not even to themselves, when constrained to speak, merely repeating some single word or their own name. There never was anything to suggest the Korsakoff or analogous syndromes; the symptoms were only those of the dropping out of certain mental faculties—deficit phenomena. Necropsy in one case, and in the two on record, showed pronounced atrophy of the frontal convolutions. The remainder of the brain was microscopically normal, but the microscope showed in parts of the cortex that the cells had evidently suffered much. A significant feature of all the cases was that the mother in two cases, and the father or a brother in the others, had had apparently the same trouble in their day. Heredity as a factor in senile dementia has not been sufficiently emphasized hitherto, he remarks, citing Tay-Sachs' findings in amaurotic idiocy in analogy.

THE DUCTLESS GLANDS WITH SPECIAL REFERENCE TO HYPOTHYROIDISM.

Kojima⁷ has examined the ductless glands from 110 consecutive autopsies at Claybury Asylum. The average weight of the thyroid gland in the insane is generally smaller than the normal. Thus the average weight is 16.46 gm. in the male, and 16.87 gm. in the female; in 12% of the male, and 18% of the female, the thyroid glands were under 10 gm. Considerable variations in the weight are found among the female cases about the climacteric, and in many female cases of affective psychosis, the thyroid was very large. The weights of the external parathyroids vary from 0.01 gm. to 0.7 gm. In 21.0% of the cases four glands were found. The average weight of the pituitary body is 0.56 gm. in the male, and 0.62 in the female. In the female cases in which the thyroid glands were small, the pituitary was generally large. The weight had no relation to the nutrition of the body, nor to the form or duration of the insanity. The average weight of the pineal gland of the adult is 0.127 gm. in the male, and 0.198 in the female. There is no difference corresponding to any particular disease. The adrenals of the male are, generally speaking, heavier than in the female. No definite conclusions can be arrived at regarding the weight of the reproductive glands in mental disease, but in certain female cases, where the thyroid gland was small, the ovaries were also small.

The systematic microscopic examination of all the ductless glands in four cases of the above series, excludes the probability that changes in any other ductless glands than the thyroid, can be held accountable for the mental symptoms, and the histological changes found in the central nervous system.

(To be continued.)

Reports of Societies.

BOSTON SURGICAL SOCIETY, (Incorporated.)

MEETING No. 8.

A CLINICAL meeting of the Society was held on Monday, December 6, 1915, at the Boston City Hospital.

The following operations were performed:

1. Inguinal hernia. Ferguson's operation. Dr. J. B. Blake.

2. Duodenal ulcer. Posterior gastro-enterostomy. Dr. F. B. Lund.

3. Chronic osteomyelitis of tibia. Dr. F. J. Cotton. Boy of 5 years. July, 1915. Three weeks after injury (and one week after the onset of symptoms) was operated for cellulitis of leg. In August medullary cavity opened, and a moderate amount of pus obtained. Sinuses closed but abscess cavity and sequestra present by x-ray. Incision, removal of sequestra and of about three-quarters of shaft, chiefly overgrowth interspersed with foci of infection. Cavity cleared; smoothed; disinfected with carbolic and packed.

4. Excision of fibrous tissue between ends of the fragments of ununited fracture of the humerus. Dr. E. H. Nichols. Case history: A. W., deck-hand, 50 years old. September 18, 1915, fell down stairs on his right arm, was taken to the East Boston Relief Station and put in an internal angular splint, with coaptation for six weeks, and at the end of that time there was no union. Admitted to the Boston City Hospital, Dec. 3, 1915, with a fracture of the right humerus at the junction of the middle and upper thirds, with mobility and crepitus. The joint is not a complete flail joint, but there is no evidence of union. It is said that at the time of his primary injury an attempt at reduction was unsuccessful, but the second attempt gave end-to-end approximation. An x-ray taken after his admission to the Boston City Hospital showed a "transverse fracture of upper and middle thirds of humerus, with good end-to-end approximation."

At the operation, Dec. 6, 1915, there was an incision three and a half inches long made on the outer side of arm over site of fracture. The incision was carried down to the bone, periosteum was opened and a small amount of callus found, but none at the level of the fracture. A firm, white, fibrous scar, obviously arising from fibrous tissue, was seen extending from the ends of the bone, and between two periosteal calluses. A considerable amount of granulation tissue was removed from the ends of the bone. The fracture was not a strictly linear one, but was jagged, and several spurs of bone were removed from either end; this allowed perfectly good approximation. The periosteal contour was approximated as carefully as could be, the muscle approximation with catgut sutures, and the skin closed with S.W.G. sutures. Double sling.

5. Reduction by plantar flexion of a "Cotton" fracture, i.e. fracture of the fibula and of the posterior articular surface of the tibia at the ankle joint. Dr. F. J. Cotton. Method of reduction shown: Plantar flexion of the foot; traction on foot downward and forward; counter traction by assistant. This reduces the displacement; then sharp dorsal flexion locks the ankle, so that there

is no possibility of re-displacement backward. Plaster put on, and the manoeuvre repeated with pressure upward on the ball of the foot until plaster had set. (This patient was given gas-oxygen anesthesia with the Clark apparatus, by Dr. F. L. Richardson.)

6. Double inguinal hernia of enormous size, operated upon simultaneously by Dr. F. B. Lund and Dr. John Cunningham, Jr. (by invitation). Case history:

Man, 50 years old, mate on a steam fishing trawler. Fifteen years ago right inguinal hernia observed, followed by a left inguinal hernia one year later of unknown origin. Trusses of various varieties have been of no service. The hernia continued to grow constantly, and at the time of operation was the size of a common football,—the right side being slightly larger than the left. The general health of the patient is excellent, and the bowels move regularly without cathartics.

Operation: Dr. F. B. Lund, left side; Dr. John H. Cunningham, Jr., right side. The left sac contained the sigmoid and several loops of small intestines. The right sac contained the cecum and several loops of small intestines. The appendix was removed, stump invaginated; appendix being normal. Contents of the sac were reduced into the abdomen, sacs transfixed, tied, and removed. The stumps fixed above the internal ring by mattress sutures. The conjoined tendons and Poupart's ligament were united, and the fascia of the external oblique placed beneath the cords on either side. The cords were left in the subcutaneous fat and the external wound closed by interrupted silk worm gut sutures. The Cunningham hernia dressing applied. Duration of the operation, 45 minutes. Anesthesia: ether, with Clark's apparatus.

DEMONSTRATIONS.

1. A case of giant-cell sarcoma of the neck of the femur. Dr. J. C. Hubbard. History is as follows:

Male. Spontaneous fracture two years ago. Incision and curetting. Plaster spica. At present walks with but a slight limp; only a slight limitation of motion. No subjective symptoms. X-ray shows a questionable area still present in the bone. Pathological report of tissue removed at the operation—osteosarcoma.

2. X-rays of a case of Hirschsprung's disease. Ileosigmoidostomy. Dr. J. C. Hubbard. History of the case: Woman twenty-three years old, who since childhood had had trouble with her bowels. Attacks of fever, delirium, and obstruction; development of a tumor in the left side. When first seen, enemata of no use. Ileosigmoidostomy and later resection of the colon. At present patient is well.

3. X-rays in a case of intestinal stasis. Dr. J. C. Hubbard. Ileosigmoidostomy with immediate resection of the colon. Great improvement. Considers herself now perfectly well.

4. A case of rupture of the spleen. Dr. J. B. Blake. A boy, eighteen months after rupture of the spleen, in whom the history and physical findings delayed the operation twenty hours. He has a very long scar. The upper part of the wound drained. There is not the slightest tendency to hernia, although he indulges in extremely active exercise.

5. X-rays of three interesting fractures: (1) Multiple thigh fracture. Double fracture of the

femur in a delirious patient, which united firmly in spite of constant motion on the part of the patient, who persisted in tearing off the apparatus.

(2) Multiple fracture of patella. X-ray before and after four operations for four consecutive fractures of the patella. (3) Central dislocation of the head of the femur. X-ray of fracture of pelvis with central dislocation of head of femur in a patient who suffered also from the same accident a compound fracture of the shaft of the humerus and a fractured skull.

6. Demonstration of the "frog plaster" double spica in fracture of the hip. Dr. F. J. Cotton. This case was an extra-capsular fracture in a middle-aged woman. Actual advantages of method: ease in caring for patient on account of ability to sit up; better chance for the old against lung complication; against apathy from monotony. It seems an excellent way to maintain position after correction.

7. Sarcoma of the chest wall with metastasis. Dr. F. B. Lund.

ROBERT B. GREENOUGH,
Secretary.

CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

REGULAR MEETING, OCTOBER 7, 1915. DR. J. RAMSAY HUNT IN THE CHAIR.

OBLITERATIVE ENDARTERITIS OR RAYNAUD'S DISEASE.

DR. C. BURNS CRAIG, from the first division, presented a case of sciatic pain with gangrene of the toes. The case is presented for a differential diagnosis between obliterative arteritis and Raynaud's Disease. The patient, a male, 51 years of age, is a bartender, a native of Germany. Had typhoid fever 25 years ago. Immediately following his recovery from typhoid he had difficulty in the use of the right leg, having a feeling of stiffness in it. The enormous varicosities of the veins soon became apparent and persisted to the present time. In his work as bartender he was in the habit of resting his weight on his left foot because of the full sensation due to the venous stasis in the right.

Patient dates his present illness from three months ago when the toes of the left foot became quite colorless and numb. The second toe then developed a dark purplish spot near the end next to the great toe, and had a portion of it removed. He was informed by a chiropodist that the toe was gangrenous.

Upon inquiry it developed that for about four years the patient had had severe attacks of pain on the mesial aspect of the great toe, and that it became reddened and swollen during these attacks. These attacks would occur at irregular intervals several weeks apart. There was no feeling of lameness nor weakness in the other parts which would suggest a claudication of the major arteries. About one year ago the little toe of the left foot began to pain, especially under changeable weather conditions. During the attack of especially severe pain he noticed a reddening of the toe. The pain during an attack was at first moderate and steady but gradually became more severe and the skin on the outside became thickened. Thinking it was a corn the

patient began to cut it in April, 1915. He thinks he cut too far and the pain persisted. It was at this time that a chiropodist was consulted and a portion of the nail of the great toe removed. Soon after this the patient felt a sharp pain radiating intermittently from the little toe to the outer side of the leg and abdomen and genitalia. At the same time he noticed that the veins became very prominent and hard both on his legs and the lower abdomen. His left foot during this period was red and swollen and the whole leg so painful that he could not longer stand or walk and was confined to bed. He complained of a curious tingling and dry sensation in his lip. There was no diarrhea. There was, however, following the eating of some ice cream in May, 1915, an acute gastric attack in which he vomited all night. He was confined to bed for a month, and there was more or less pain in the stomach, of a mild character, during this time.

In July, 1915, a severe sciatic pain, over the left hip, developed, and has persisted to the present time. This pain has ordinarily been more severe than the pain in the foot. About the same time the gangrenous spot on the second toe previously mentioned, developed. Following this all the toes rapidly turned reddish, bluish, then assumed the deep purple, almost black color, which they now present. There has been no pain in the foot since, except when it is depended. Patient has noticed at times a prolonged whiteness and numbness of the fingers after having them in cold water for any length of time.

The patient is a sparely nourished man, with a dry coarse skin, and presenting an appearance of age beyond his years. There are curious brownish macules, about pin-head size, scattered over the skin. The veins over the lower abdomen are prominent, and the right leg is a mass of venous varicosities. The femoral arteries are palpable, but there is no pulsation in the knotted cord which was once the left popliteal artery, nor are the left posterior tibial or dorsalis pedis pulsative. The right foot is cyanosed, and the epidermis of both soles is dry and cracked. The left lower extremity is atrophic and about 3 cm. smaller than the right at corresponding points. This difference is partly due to the varicose, edematous state of the right leg. The left foot in the upper part is cold and pale, the lower part is reddened, while the four outer toes are dry, of a bluish black color, of subnormal temperature, in fact mummified. The great toe is cyanotic with a small bluish area at the tip.

The general vascular system shows a moderate degree of fibrosis but no cardiac disease. The systolic blood pressure in the arms varies from 125 to 160. The viscera present no abnormality. The cerebrospinal fluid and the blood are alike negative. The urine and stool is normal.

The question may properly be raised as to whether the repeated attacks of pain in the great toe over a period of four years, the persistent cold, numb feeling in the fingers after exposure, the dry tingling sensation in the lips, the gastric attack and the final gangrene of the toes, were the result of arterial spasm as is the case in Raynaud's syndrome. But the fibrous state of his general arterial system, the complete obliteration of the left dorsalis pedis and posterior tibial and the nodular cord-like state of the popliteal, together with the unilateral character of the gangrene, though this last is not necessarily an invariable reason, tend to group the case under the obliterative endarteritic group.

DISLOCATION OF THE SECOND CERVICAL VERTEBRA; LAMINECTOMY FOR THE RELIEF OF ROOT PAINS.

DR. ROCHEFORT presented from the third division a case of posterior dislocation of the second cervical vertebra with severe root pains promptly relieved by decompressive laminectomy. The patient was an epileptic, 56 years of age, who was admitted to the service of Dr. Bailey on Sept. 10, 1915. About a month before admission, in an epileptic attack, she fell, striking on her neck and head. Directly after recovering from the attack of epilepsy, she experienced severe pain in the back of her neck and over the occipital and mastoid regions. The pain was almost constant and very severe. The slightest movement of her head, the pressure of her clothes, or of the pillow, caused a marked increase in intensity of the pain. When she was admitted to the institute, her head was held rigidly and turned slightly to the left. She was unable to lie down on account of the pain. The right trapezius and sterno-mastoid were very tense and the left muscle slightly so. The spinous process of the second cervical vertebra was very prominent and there was marked tenderness on pressure over the upper three cervical vertebrae. There were no distinct sensory disturbances, but the area of pain corresponded to the distribution of the occipitalis major and minor, and auricularis magnus nerves. There were no spinal cord symptoms. The x-ray examination showed that the second cervical vertebra was dislocated backwards causing a marked distortion of the spinal canal. It was evident that the symptoms were due to traction on the second and third cervical nerve roots. Laminectomy was performed on Sept. 25, 1915, by Dr. Elsberg, the spines and laminae of the second, third, and fourth cervical vertebrae being removed. The spine of the second cervical was much thickened, very prominent and pointed to the left and there was a hiatus of about one centimeter between the articular surface of the first and second vertebrae on the right side. On incision of the dura a large amount of cerebrospinal fluid escaped. There were numerous arachnoid adhesions on the right side which were divided. The cord itself appeared normal. The wound was closed in the usual manner without drainage. Duration of the operation was twenty-four minutes. The condition of the patient at the end of the operation was excellent. Recovery was uneventful. The patient was discharged and has remained well up to the present time. The case is a most unusual one of dislocation of the axis upon the atlas with severe symptoms referable to the second and third cervical roots and without any other spinal symptoms.

UNLOCALIZABLE BRAIN TUMOR; SUDDEN DEATH.

DR. J. L. JOUGHIN presented from the service of the first division, a case of unlocalized brain tumor. The patient, a female aged 54, had always been in good health until the onset of the present illness which began in May, 1915. Her past history is negative in so far as it relates to her present condition.

In the early part of May occurred the first symptom, a slight unsteadiness in the gait, which at that time incommoded her little but which has slowly progressed until to-day you see her unable to walk except with assistance. A few days later, almost immediately after having her teeth drilled by a dentist, the second symptom developed, an intermittent tinnitus of the left ear, a manifestation which still persists.

On June 15th she was first seen by a physician and from that time until July 29th no very definite change in her condition occurred although locomotion became increasingly difficult. On this latter date she was seized with a violent attack of vomiting accompanied with severe pain in the epigastrium. This was the first of a number of distressing attacks similar in character except that they were unaccompanied by gastric pain. These crises, ordinarily matutinal, were usually induced by the ingestion of food and were often preceded by nausea. Only on one or two occasions was the vomiting projectile in character. They have gradually increased in frequency. Previous to the onset of this illness the family has no recollection of the patient having ever vomited.

Late in July or early in August (it is impossible to determine the period with exactitude) her acuteness of vision began gradually to diminish. It is definitely ascertained, however, that as late as the first week in September she was still able to read the smaller type of the newspapers. Since that time visual acuity has rapidly decreased so that today she can read only with great difficulty heavy block letters one centimeter in height.

During September she complained of severe, lancinating, paroxysmal headaches, localized between the eyes. Rarely were these headaches at the vertex or occipital. These paroxysms often preceded the vomiting and were relieved by it. They have gradually become more severe, possibly more frequent, and now make her life unendurable except in the interval between the paroxysms when she is free from pain.

Weight has been progressively lost, probably largely due to the fact that she voluntarily refrains from eating, owing to the headache and vomiting thus induced. Her mental processes are slowed and the resultant difficulty of comprehension renders it impossible for her satisfactorily to cooperate in her physical examination. Except for this retardation and a little occasional nocturnal confusion her mental condition is unimpaired.

Briefly resumed, her physical status is as follows: Station and gait are both impossible, as she falls when unsupported, though in no particular direction. In walking she slides her feet along the ground, taking always a very small step. All the tendon reflexes are normal. There is neither clonus nor Babinski. The cutaneous abdominal reflexes are probably present though sluggish. Coordination in arms and legs is unaffected. Sensation in all its modalities is apparently normal, and this includes trigeminal findings, although the patient's responses are not always completely satisfactory. Speech is slow but otherwise intact. The sphincters function well, although on one or two occasions since entering the hospital there has been urinary incontinence. The cranial nerves are all intact. There are no cerebellar signs.

The eyes are normal except for a high degree of refractive error (5 to 6 diopters of hypermetropia) and changes noted in the fundus. These fundus changes are papillo-edematous in character and are more marked on the left side than on the right. Although the degree of swelling is at a minimum the diagnosis of papillo-edema can, nevertheless, be made by the obliteration of the normal disc outlines, and the distinct though slight tortuosity of the retinal veins. In order to exclude the possibility of this appearance being due to the marked hypermetropia, the fundus has been examined a second time with

corrective lenses placed before the eyes. This second investigation has confirmed the previous opinion that the changes observed are evidently symptomatic of increased pressure within the cranial cavity. Vision on the left is 20/100, on the right 20/70. The ears have not as yet been examined.

The serological and other laboratory investigations have revealed nothing which can help us from the standpoint of diagnosis, the only abnormal feature being a pleocytosis in the cerebro-spinal fluid of 20 cells per cubic millimeter. The systolic blood pressure has varied between 110 and 130 millimeters.

The case is shown as one of unlocalizable brain tumor, in some respects atypical notably in the early involvement of the gait, the onset of the general symptoms indicative of increased intracranial pressure at a period months later, the marked visual deficit with a very slight swelling of the optic disc, and the possibility that the nerve head changes might be attributed solely to the existing high refractive error.

[NOTE.—This patient was found dead in bed five days after presentation at the above conference. She had been seen by a nurse fifteen minutes previously, who reports that she was apparently in the same condition as she had been throughout her stay in the hospital.

The rapid clinical course, the slight pressure symptoms with late onset, and the sudden death strongly suggest a gliomatous infiltration, the lethal ending being induced by a hemorrhage within the growth. Owing to the absence of an autopsy no definite statement can be made.]

A MIXED VAGOTONIC AND SYMPATHETICOTONIC STATE, IN A CHILD AGED 5.

DR. GUSTAVE BOEHME presented from the third division L. P., age 5 years, native of United States, of Hebraic extraction.

The patient is an only child. His mother has never had a miscarriage. The father has never had any venereal disease. His birth was normal. The first teeth were erupted at six and one-half months, but at seven months they so interfered with the frenum of the tongue that they were extracted. He walked at twenty months, but fell a great deal. He talked at three years but had used the expressions "papa" and "mamma" at one year.

When one day old he had pneumonia, lasting three days. The mother noticed that when he nursed, his face would reddened markedly. At six weeks he had an attack of facial eczema which lasted two months. There then began attacks of bodily and facial twitchings, which have continued to date.

At eight months he again had pneumonia. At eleven months he had measles, of an atypical type, lasting three days. At two and one-half years there occurred a period during which he did not open his eyes for six months. There was no febrile reaction at this time. Recovery was spontaneous.

He has always vomited a great deal, the vomiting being rather of a regurgitating type than of a projectile variety. After all meals he has a marked vasomotor flushing of the face and arms associated with a violent cardiac palpitation. At times the eyes protrude markedly. The convulsive seizures still continue at intervals of three to four months. They are described as a stiffening of the child's arms and legs in flexion with a slight degree of opisthotonus. The child falls if not supported, but

comes to immediately after the mother blows on its face or fans it. Since he has begun to walk, the gait has been on his toes, with the heels rarely touching the ground.

His appetite has always been good. His bowels tend to move freely, but at times there is a slight constipation. Urinary incontinence has been marked, with an appreciable increase in quantity.

To sum up, therefore, we have a child who since birth apparently has suffered from

1. Vasomotor flushes, especially at time of feeding.
2. Tachycardia, especially at time of feeding.
3. Vomiting of a regurgitant type.
4. Hyperidrosis.
5. Urinary incontinence with polyuria.
6. A peculiar gait characterized by toe-walking.
7. Transient attacks of marked exophthalmos.
8. Transient convulsive seizures.

Physical Examination reveals a rather undersized boy with coarse features generally. His hair is dark and rather coarse. His face is slightly cretinoid in type. There is a varying exophthalmos, somewhat more marked at one time than at another. While under examination his face flushes to a bright red, irregularly and patchily distributed. The wrists are also markedly red and hot to touch. The skin varies during examination, at times being very moist, at others dry. The child walks upon its toes, but the condition seems less marked than the mother describes it. If the patient be permitted to eat, the vasomotor flush becomes marked on face, hands and body. There is then marked cardiac palpitation and a tachycardia of from 100-130. The blood pressure varies from 90-100 systolic. The heart is normal. The pupils as a rule are dilated and the eye-slits are widened. The pupils react to light and accommodation. Pressure on the eyeballs does not seem to vary the pulse. The knee, ankle, and arm jerks are normal, as are the superficial reflexes. There is no Babinski or ankle clonus. The tests for cutaneous sensibility, as far as the patient will co-operate, are normal. The lungs are normal. There is no thymic dullness, nor general lymphatic enlargement. The tonsils are slightly enlarged.

Serological findings are negative.

No x-ray of the pituitary region or of the chest was taken.

As to carbohydrate tolerance, this was not undertaken, but it might be mentioned that he has done better under carbohydrate diet.

Therapeutic observations:

Thyroid, gr. half to one three times daily did not change the condition.

Atropin in the form of Tr. Belladonna m. V. t.i.d. brought on an intense vaso-motor flush, marked tachycardia and cerebral excitement.

Epinephrin, gr. 1/200 b.i.d. produced a rather beneficial result. His incontinence was improved, his flushes were much less marked; there were no vomiting and no convulsive seizures. His blood pressure rose to 130. He ate better. This condition lasted for one month, when there was a total relapse, but there was no vomiting. The urinary condition slowly returned.

Pituitary Extract, gr. 1/100 q.d. aggravated his trouble. His flushes were more marked. He could not rest at night. Convulsive seizures returned and there was marked vomiting.

At one time, feeling that there was some spasmodic tendency, I gave calcium lactate, but with no effect.

A CASE OF PSEUDO-BULBAR PALSY, WITH REMARKS ON THE BULBAR REFLEXES.

DR. J. RAMSAY HUNT presented from the first division a case of pseudo-bulbar palsy with remarks on the bulbar reflexes.

The patient is 60 years old, a carpenter by occupation. He has been intemperate in the use of alcohol. Lues is denied, and the Wassermann reaction is normal.

Onset of the disease,—3 years ago with weakness and numbness of the left arm. The same day the left leg also became involved. A slight left hemiparesis with dragging of the left leg has persisted up to the present time. No disturbance of speech in this attack. He has had occasional vertigo, but no headaches. In July, 1914, three years after the original seizure, he developed suddenly, without vertigo or loss of consciousness, a disturbance in speech (dysarthria) and of deglutition, associated with weakness of the extremities on the right side. With the bulbar symptoms are associated atypical attacks of spasmodic or explosive crying. These always begin with a peculiar feeling of pharyngeal constriction, followed by short spasmodic coughs, filling the eyes with tears, and a spasmodic contraction of the facial muscles of expression. The attack lasts only a few seconds, and as a rule is soon brought under control. At times only the pharyngeal constriction, spasmodic cough and effusion of tears occur, the further extension to the muscles of expression being inhibited. Such seizures occur spontaneously or may be produced by emotional stimuli or by irritation of the soft palate. The vesical and rectal sphincters are normal. There is no pronounced mental deterioration, although his mental processes are not so keen as formerly. Attacks of spasmodic laughter have not been observed.

Physical Examination. A large, well developed man; station normal; gait is slow and somewhat stiff; the left arm is weaker than the right; no atrophy and no fibrillation of the muscles of the extremities, which are slightly spastic, more so on the left side. There is no tremor and no ataxia. The knee jerks are brisk, left greater than the right; achilles reflex active, left greater than right; no clonus. The arm jerks are also lively, more so on the left side. Abdominal reflexes absent, cremasteric reflexes present and equal. Left plantar reflex is of the Babinski type, the right plantar shows extension of the small, but flexion of the great toe. The sensation, both superficial and deep, are normal. The pupils are equal and react promptly. Ocular excursions normal. Facial enervation is equal and normal. Muscles of mastication are strong and prominent. Masseter reflexes exaggerated. Tongue is protruded straight, movements somewhat slow. Innervation of the soft palate is weak, but equal on the two sides. Laryngoscopic examination is negative (Dr. Culbert). Vision and hearing undisturbed. The speech is slow and indistinct and enunciation of words is difficult (dysarthria). There is also a rough laryngeal quality of the tone; some difficulty in swallowing solid food. Corneal reflexes present and normal, the pharyngeal reflex is present but diminished. An unusual sequence of the pharyngeal reflex is its rather frequent emergence into an attack of spasmodic weeping. For example, on irritating the soft palate, as in the production of the pharyngeal reflex, there first occurs a sense of pharyngeal constriction, then a series of explosive respiratory coughing sound,

followed by emotional facial grimaces and lacerimation. At times only the expiratory and coughing element follows the irritation of the palate. Another interesting reflex is evoked by stroking firmly with a tongue depressor the hard palate; this induces quite constantly a slow contraction movement of the left angle of the mouth on the opposite side. This reflex may be elicited with equal facility from either side of the hard palate.

Remarks. This case is presented as an example of pseudo-bulbar palsy, and is interesting from the comparative mildness of the symptomatology. Diagnosis is based on the development of bulbar symptoms with the second attack, the first attack producing merely a slight hemiplegic disturbance, evidences of which still persist. That the pyramidal tracts on both sides are affected is indicated by bilateral weakness and exaggerated tendon reflexes. There is no atrophy of the muscles of the tongue or of mastication, and the extremities are likewise free from evidences of atrophy and fibrillation; so that glosso-labio-pharyngeal palsy and the bulbar type of amyotrophic lateral sclerosis may be excluded. The absence of atrophy is also against the acute apoplectic form of bulbar palsy. Without attempting an exact localization, it may be assumed that there is a double lesion involving the cortico-bulbar tracts on both sides, thus causing supranuclear interference with the bulbar functions (dysarthria, dysphagia and dysphonia). Of a special interest and significance are the explosive outbursts of crying. This emotional motor expression of grief or of joy is a purely automatic function, in which the centers for lacerimation, deglutition, expiration and expression play a predominant role; this mechanism is apparently independent of the higher cortical function, except for certain inhibitory influences.

It is this controlling or inhibitory influence which is disturbed in pseudo bulbar palsy, so that slight impulses of reflex emotional or associated origin may initiate an attack. In severe cases such outbursts may reach the most violent and extreme expression of grief. In the present case it is more subdued and is more readily controlled. It is also of interest to note that the usual pharyngeal reflexes overflow and cause a discharge of this mechanism, as in the case just described. The presence of a slow contralateral reflex contraction of the angle of the mouth on stroking the hard palate, is also to be emphasized, and is probably only another manifestation of the hard palate reflex described by Laehr and Henneberg, in which movements of the orbicularis oris follows stroking of the hard palate. Ferrero has also described contralateral reflex contraction of the face on stroking the soft palate. Another example of a bulbar reflex is the so-called *fress* reflex described by Oppenheim in Infantile Pseudo-Bulbar Palsy, which consists of a combination of suckling, chewing and swallowing movements after stroking tongue or lips.

The brain stem and basal ganglia, therefore, contain mechanisms which are concerned in the production of rather elaborate and complicated automatic acts, which are controlled by the higher cerebral centers. These furnish important symptoms when the cerebral inhibition is lost, as in pseudo-bulbar palsy, and there is produced as a result explosive laughter and weeping and various types of bulbar reflexes, a return, as it were, to the bulbar condition of infantile life before the inhibitions are developed.

CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

REGULAR MEETING NOVEMBER 9TH, 1915.

DR. J. RAMSAY HUNT in the Chair.

A CASE OF ACUTE (APOPLECTIC) BULBAR PARALYSIS.

DR. WALTER CLARK HAUPT in presenting this case from the First Division, said that it displayed many unusual features, not the least interesting of which was the possible syphilitic origin of the disease. Furthermore, the question of distinction between true bulbar palsy of vascular origin and pseudo-bulbar palsy comes up, and is not an easy one to decide satisfactorily.

The patient, a widow thirty-two years of age, was admitted on Dr. Collins' service October 28, 1915. She complained of inability to walk unaided, difficulty in standing without support, weakness of her arms, a numb and cold sensation in the arms and legs, and occasional crying and laughing spells.

Her family history records no disease peculiar to her kin. She had measles, mumps and an attack of jaundice as a child. Aside from an operation for varicose veins of the right leg, she never had any serious illness. Menstruation began at twelve and has always been irregular, but not painful. At the age of seventeen, she married a man forty-three years her senior. A year afterward, she bore a child which died when six months old because "the measles would not come out." Her fifth child died at the age of four months of malnutrition. Four of her children are living and well. She lived happily with her husband until about five years ago, when he had a stroke of apoplexy at the age of seventy-four. From that time on, he began scolding and berating her and making life miserable for her.

About the end of July, 1910, there was a violent scene after her husband had accused her of unfaithfulness. He choked her until her older boy hit him over the head with the end of a whip. She was greatly excited and her distress was increased when her husband's relatives accused her of having struck her husband, and threatened her with arrest. She went to bed that night at about eleven, weeping and thoroughly wrought up, but fell asleep in about half an hour. Around midnight she woke up because "her body was burning hot all over." She called to her daughter, got up and sat on a chair until she began to feel chilly, whereupon she returned to bed. She remembers that she was very thirsty at this time. After a few minutes, she found that she could not move her arms or legs; the latter were "stretched out and stiff." Her arms were "folded over her breast," her fingers contracted, her tongue was hanging out of her mouth which she was unable to open any further, or close. She had great difficulty in swallowing, choking especially on fluids that were given her. She was unable to speak, but was conscious of everything going on and remembers hearing the doctor say that she would not live until morning.

Three days afterward she was taken to the Hudson Hospital, where her condition gradually improved. Two weeks after entrance she was able to move her arms slightly. After three weeks, her power of speech began to return. All this time her lips felt swollen, her tongue seemed thick, and she had difficulty in moving it. Two months after her attack, she could talk so that one could understand

her, but not for half a year could she talk fluently. For four weeks after her attack, her legs were completely paralyzed; then she found that she could move the left, and a short time later the right one laterally. Her right leg has been much slower in improving than the left. While at the Hudson Hospital, where she remained six weeks, she was incontinent of urine and feces. At the time of her attack she "felt numb all over." Sensation gradually returned to the upper and then to the lower extremities. Up to the present day, her hands and legs feel cold and she often has a sensation of pins and needles in her fingers.

When she left the Hudson Hospital she could neither walk nor stand without support, nor was she able to lift her hands above her head. She gradually became stronger at home, and could stand up while doing a little housework. Though the fingers of her right hand were somewhat difficult to open, she gradually acquired fairly good power of her arms.

Her life has not been happy during the last few years, and she is inclined to be melancholy. She has occasional crying spells over which she does not seem to have control, and at other times bursts of laughter, which are also hard for her to stop.

Physical Examination. The patient is short and rather obese. The hair is scanty, hirsute and pubic hair not abundant. Teeth are carious or absent. Cardio-respiratory system is negative. Blood-pressure, 135. Abdominal examination reveals nothing abnormal.

The pupils are equal in size, irregular in outline, and react sluggishly to light and accommodation. The external ocular movements are normal. There is no nystagmus nor diplopia. Vision and fundi are normal and the fields are complete (Dr. Holden). There is no facial paralysis nor masseter weakness. Examination of the larynx and nasopharynx is negative (Dr. Culbert). The tongue is protruded in the midline and shows no atrophy nor tremor. The palatal reflex as well as Henneberg's sucking reflex are not obtained. On phonation, the excursion of the palate appears somewhat smaller than normal. Patient has no difficulty in swallowing liquids or solids. Her speech is not indistinct and she repeats all test phrases without stumbling.

Her gait is extremely spastic and she has great difficulty in walking, taking very short steps. She cannot stand without support and leans her body forward.

The nutrition of her upper extremities is good and no atrophy can be made out. Range of movement is normal in all directions. Muscular power is only fair, and there is moderate spasticity of the right arm. No tremor, incoordination, astereognosis or adiadochokinesis. There is increased myotatic irritability. The biceps, triceps, periosteal-radial reflexes are all hyperactive. Hoffman's sign is present on both sides.

Abdominal and epigastric reflexes are not obtainable.

In the lower extremities the nutrition is good, and there is no local wasting or atrophy. Both legs are in a markedly hypertonic state, the right more so than the left. Flexor and extensor muscles both of thighs and legs are spastic. There is distinct adductor spasm. Myotatic irritability is increased. No fibrillary twitching or tremor are seen. The patient can elevate the left leg from the bed to an angle of 30°, the right one-half that distance. At the knee joint flexion and extension are greatly lim-

ited. The right leg can be flexed only about 10° and the left about 30°. Range of movement at the ankle joint is also limited, and this is again more marked on the right. The toes are the only part of the lower extremities which she can move freely. Of the tendon reflexes, the knee and ankle jerks are exaggerated. Plantar stimulation gives first an extensor then a flexor response. The Babinski and Oppenheim phenomena are present on both sides. There is a double inexhaustible ankle clonus. Patella clonus is not obtainable on account of the marked spasticity.

There are no objective sensory disturbances; perception of tactile, painful and thermal stimuli being equal and normal everywhere. There is no loss of postural sense either in the upper or lower extremities.

Examination of the blood, urine, gastric contents and feces are reported normal. Dr. Kaplan found the Wassermann reaction of the blood serum positive on two occasions, while it was reported indeterminate in Dr. Fordyce's laboratory. The cerebrospinal fluid has been negative throughout on two occasions.

The electrical reactions of the muscles of both the upper and the lower extremities were found to be normal. All muscles respond actively to Faradism except the right soleus and gastrocnemius where the reaction was not complete, probably due to operation scar tissue. The response to Galvanism was normal everywhere except for the shoulder muscles, where it is diminished, probably on account of the thick covering of adipose tissue. The reaction of degeneration was nowhere demonstrable.

Summary. After enjoying twenty-seven years of ordinary good health, the patient suddenly developed, subsequent to severe emotional strain, a glosso-pharyngo-labial paralysis with spastic paraplegia of all four extremities. The symptoms began to disappear two weeks after onset. No further improvement took place after one year, and the condition has remained stationary for about four years, the residuum of her attack consisting of a spastic paralysis of both lower extremities, moderate spasticity of right arm, fatigability of both upper extremities, paraesthesiae in both arms and legs, and occasional spasms of wheezing laughter and crying spells. The positive findings on physical examination are: Sluggish, irregular pupils, slightly diminished excursion of palate on phonation, absence of palatal reflex and of Henneberg's sucking reflex, spastic gait, inability to stand without support, diminished muscular power of upper extremities, exaggerated reflexes, spasticity of right arm, increased myotatic irritability, bilateral Hoffman's sign, absence of abdominal and epigastric reflexes, marked spasticity of lower extremities with greatly diminished muscular power, exaggerated knee and ankle jerks, double Babinski and Oppenheim, double inexhaustible ankle clonus, positive serum Wassermann.

The sudden development of a glosso-pharyngo-labial paralysis, associated with paraplegia of all four extremities, and especially the subsequent regressive course of the disease, mark this case as one of acute (apoplectic) bulbar paralysis. The positive character of the Wassermann reaction points to a luetic origin of the trouble, possibly a syphilitic endarteritis of the basilar artery, as Oppenheim explains cases of this character, ascribing the sudden apoplectiform onset of the symptoms to a transient complete obstruction of that vessel, and

attributing the regressive course of the disease to a restoration of the circulation before death of the tissue has occurred.

In many cases, the differential diagnosis between acute bulbar paralysis and pseudo-bulbar palsy is difficult, as the symptoms of the two syndromes are essentially the same. In this case, however, there are certain factors which enable us to exclude one disorder in favor of the other. In the first place, the symptoms of pseudo-bulbar palsy usually develop in the course of several apoplectic seizures, and hardly ever come on in a sudden attack as in this case. Furthermore, in the great majority of cases of pseudo-bulbar palsy, there are present signs of general arteriosclerosis which are not observed in this patient. Lastly, pseudo-bulbar palsy does not show the regressive course which the symptoms in this case have taken, and which is observed in the less severe cases of acute bulbar paralysis that do not end fatally within a few days, due to bronchopneumonia or paralysis of the respiration and heart.

The sudden onset of the symptoms in one apoplectic attack, the absence of signs of general arteriosclerosis and the regressive course of the symptoms, speak in favor of acute bulbar paralysis, the probable etiological factor in this case being a transient thrombosis of the basilar artery, on the basis of a luetic endarteritis.

SUB-ACUTE COMBINED SCLEROSIS OF OBSCURE ETIOLOGY.

DR. WALTER TIMME presented from the third division a tailor, 48 years of age, married, with five children, all well, who entered the hospital on November 5th, 1915, with the following history. Some six months ago he was compelled to close his shop in a fashionable neighborhood of Paris on account of the war. This entailed a considerable loss of money, the loss of a well-established business, and an intense mental shock. Shortly thereafter, he began to notice a weakness in both legs, and various paraesthesiae in both feet. This condition gradually got worse and he came to America hoping to begin anew, and at the same time improve his health. He obtained employment here, but his condition grew from bad to worse until now he cannot walk nor stand, but has pain and stiffness in both legs, with no actual sphincteric trouble. His examination upon entrance showed that he could neither stand nor walk, that he had marked spasticity of both legs with a double Babinski, Oppenheim and Gordon, double ankle and patellar clonus, with of course extremely hyper-acute tendon reflexes. The abdominal, epigastric and cremasteric reflexes are absent. His pupils are irregular, somewhat unequal, practically fixed to light, reacting slightly to accommodation; of true Argyle-Robertson type. His tongue deviates slightly to the left and he has had an occasional diplopia. He has some subjective sensory changes, in addition to the paraesthesiae already mentioned, in both fingers and toes, namely, a well-marked girdle sensation at about the 12th dorsal distribution. Since coming into the Institute he has been running a low temperature, highest in the evening, varying between 98 and 101 degrees. His blood and spinal fluid are entirely negative as to the Wassermann reaction, cell count and globulin. His urine shows a slight trace of albumin. His blood examination shows the following: there are but 2,700,000 red cells, some of which show stippling and others show signs of degeneration. The differential white cell count is

practically normal. The case is, therefore, in all probability, one of sub-acute combined sclerosis.

These cases of combined sclerosis are fairly numerous in the literature. They have usually arisen after severe shock or fright, after prolonged exercise, but chiefly after infectious systemic diseases, such as typhoid, malaria, diabetes, pernicious anemia, and a host of others, less well defined. The fact that the present patient has a blood condition of pernicious anemia, and is running a temperature of low degree, may put him in a group in which a chronic malarial or other cachexia has produced a blood picture of pernicious anemia. Another fact which ought to be considered in conjunction with these two debilitating ones, is the intense mental anxiety and strain, and deep disappointment and discouragement entailed by the loss of his business and savings in Paris, as a result of the war conditions. The Argyle-Robertson pupil present in this case is a factor difficult of explanation, in light of the three separate negative syphilitic findings in his blood and spinal fluid, at three different periods in the course of his disease. Yet a similar pupillary picture in non-luetic cases has been seen by other observers, notably, Marburg, Oppenheim, and Frankl-Hochwart. Whether the phenomenon is due to direct involvement of the ciliary ganglia, or else to the condition of the cord at the level of the cilio-spinal centres, is a moot point.

The progress of the case will be further reported.

ACUTE DISSEMINATED MYELITIS, FOLLOWING ACUTE STREPTOCOCCUS INFECTION OF THE EAR.

DR. J. RAMSAY HUNT presented from the second division, a woman thirty-five years of age, a domestic servant by occupation. Her previous history is negative and without especial interest. She was in excellent health until April 1st, 1915, when the right ear became painful following a "cold." The pain in the ear was very severe for two weeks, and was then followed by a purulent discharge from the canal. On the appearance of the discharge, the pain diminished in severity. After the ear had discharged for about three weeks, the flow suddenly ceased, the pains in the ear and mastoid returned and became increasingly severe, and she applied to the New York Eye and Ear Infirmary for treatment. She was admitted to the service of Dr. Gorham Bacon on May 11th, 1915, a diagnosis of acute mastoiditis was made and operative treatment recommended. On May 13th, Dr. Saunders performed a mastoid operation which included exposure of the sinus, and a considerable area of *dura mater*. Bacteriological examination of purulent matter removed from the mastoid cells, showed the presence of numerous colonies of *streptococcus longus*.

On the fourth day following the operation, she complained of indefinite pain in the back and lower extremities, followed by weakness and paraesthesia of the trunk and legs. These symptoms were accompanied by fever and chilly sensations. *Examination* at this time showed weakness and ataxia, and she was unable to stand or walk without assistance. Blood cultures made on May 18th, 1915, were quite negative. The cellular constituents of the blood showed marked changes: Red cells, 2,200,000; white cells, 5,000; hemoglobin, 45%. Differential count as follows: Small mononuclears, 61%; large mononuclears, 4%; polymuclears, 34%; eosinophiles, 5%; mast cells, 5%. The red corpuscles were irregular in size with clear central areas. The urine was

normal. Pains in the lower extremities continued and soon extended to the neck and arms, especially on the right side. There was also a painful girdle sensation at the umbilical level, and a sense of constriction about the neck. Vesical symptoms and difficulty in defecation were also present. There was some headache low down in the occipital region, but no vertigo, delirium, or other central symptoms.

The mastoid wound healed without complication, but the spinal symptoms persisted and for a time increased in extent and severity.

Neurological Examination. On June 16th, 1915, I first saw the patient at the request of Dr. Bacon and Dr. Saunders. She was then almost paraplegic and unable to stand without assistance. There was marked static ataxia (Romberg symptom). She complained bitterly of pain in the neck and lumbar region, and there was a painful sense of constriction around the waist, with paraesthesia of the hands, and both lower limbs to the knees. The motor power of the arms was undisturbed and there was no ataxia or tremor. The knee jerks and achilles jerks were exaggerated, and there was a tendency to ankle and patellar clonus on both sides. The abdominal reflexes were elicitable, and the plantar reflexes were much diminished and of the flexor type.

There was marked disturbance of sensibility, both superficial and deep, of the lower extremities.

The pupils were equal and reacted to light and accommodation. Vision and the optic nerves were normal and there was no nystagmus or paralysis of cranial nerves. Articulation was not affected.

At this time (June 16, 1915,) a Wassermann test of both the blood and spinal fluid was negative, and there was no increase of the globulin content or of cellular elements. A blood count at the time showed some improvement over that taken on May 18, but there was still severe anemia: Red cells, 2,160,000; white cells, 4,000; haemoglobin, 70%. Differential count: Small mononuclears, 53%; large mononuclears, 10%; polynuclears, 36%. One nucleated red cell was found.

The diagnosis was made of a spinal cord affection, probably a myelitis of infectious or toxic origin. She remained in the Infirmary until August, 1915, without material change in her condition, and was then transferred to the New York Neurological Institute, and was admitted to the Second Division.

Her complaints on admission were as follows: Pain in neck and dorsal region, with broad girdle sensation about the chest and upper abdomen. Pain and painful paraesthesia of the lower extremities and to a lesser degree of the arms, especially the right. Rather a constant area of pain in nape of neck extending to the right shoulder. Occasional incontinence of urine and also of faeces after laxatives. Inability to stand or walk. There is no complaint of headache, vertigo, diplopia, nor visual disturbance. Her mind is perfectly clear.

Examination. August 8th, 1915. The patient is bedridden and incontinent. No decubitus. Pupils are equal and react to light and accommodation. No nystagmus.

The cranial nerves, including the optic discs, are negative.

The spinal column shows no deformity, but there is some tenderness on pressure at the level of the 4th D. and 8th D. spines, and there is very slight stiffness of the neck. Movements of the arms are

free and there is no ataxia or tremor. The grip of the right hand is somewhat weakened, and the right arm is the seat of pain and paraesthesia, but without gross disturbance of sensation. The tendon reflexes of the upper extremities are present and not exaggerated.

Both lower extremities are spastic and paretic, the right more than the left. There is well-marked patellar clonus and ankle clonus on both sides. The plantar reflexes are of the extensor type (Babinski). The abdominal reflexes are absent.

The postural sense of the toes is disturbed on both sides and the superficial sensibility, touch, pain and temperature, is diminished or lost in irregular areas below the umbilical line, above which there is a broad zone of hyperaesthesia.

On August 8th, 1915, the Wassermann tests of the blood and cerebrospinal fluid were again negative, and there was no increase of globulin or of cells. The urine was negative. An examination of the blood on November 6th, 1915, showed 4,782,000 red cells with 70% of haemoglobin. While under observation, there had been no fever and the examination of the internal organs, heart, lungs and abdomen, showed no abnormalities.

Comment. The patient remained in the Institute three months, during which time there was a gradual abatement of the subjective symptoms, with some return of power in the lower extremities. When discharged, November 15, 1915, there was still spastic paraplegia with paraesthesias and a girdle sensation. The spinal cord symptoms had, however, shown a distinct improvement, no new symptom had developed and the tendency was to retrogression, and not progression of the disease. There was, therefore, every reason to hope, that the inflammatory process had been checked by the defensive forces of the body, and that eventually, those neural structures which had suffered, would gradually recover a considerable portion of their function. It is probable, however, that some weakness and spasticity will persist as a result of permanent injury to the pyramidal tracts.

As the spinal cord symptoms had followed so soon after the operative procedure, it was thought likely that the organisms (streptococci) or their toxins, had entered some of the venous channels, thus reaching the general circulation. Just why the hematogenous infection should have become localized in the spinal cord, is as much of a mystery in this case as in other of these obscure selective forms of inflammation. The possibility of a direct infection of the subdural space was also considered, with secondary invasion from the cerebrospinal fluid of the *medullae spinalis*. Such an invasion of the cerebrospinal fluid would be much more likely to cause meningitis with the clinical and pathological features of this disease, and while it is true that slight meningeal symptoms were noted, as spinal pain and some stiffness of the neck, yet these were not more acute than are commonly observed in myelitis, and the fluid obtained by lumbar puncture was free from any signs of inflammatory reaction.

The extreme degree of the infective and intoxication process, is shown by the severe secondary anemia which was present. That this was merely a secondary anemia, was evidenced by the marked improvement in the blood picture, after the subsidence of the infection, and the funicular myelitis associated with pernicious and other grave anemias may, therefore, be excluded.

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MODERN PROBLEMS IN OBSTETRICS.

THE modern development of obstetrics, like that of other branches of medicine, has not resulted in the establishment of a stereotyped science or art. Classic operations and modes of procedure, it is true, have acquired a recognized position in obstetric practice; but there has been no tendency for the subject to become stationary. On the contrary, with the constantly broadening general scope of medicine, new conceptions and modes of regard have arisen in obstetrics which lead to constant progressive variation in its purposes, methods, indications and technic. New advances in scientific knowledge in other fields are extended and applied in the field of obstetrics with analogous results in progress to those following the introduction of surgical anesthesia and the recognition of the bacterial etiology of inflammatory disease. With these constant advances there arise constantly new problems, in dealing with which the clinical experience and experimental investigation of modern obstetrics are concerned.

In the present issue of the JOURNAL, which is published as an obstetric number, we take pleasure in presenting a series of papers dealing with various aspects of two of the more important of these modern problems in obstetrics,—Caesarean section and obstetric anesthesia. *A priori* it might seem that Caesarean section were an operation likely soon to become stereotyped in its performance and application; yet in point of fact it is a procedure whose more extended use has given rise to wide divergences of opinion relative to its indications and its technic. The three articles on Caesarean section which compose the symposium on that subject in this number are striking illustrations of the important differences that may exist in the theory and in the practice of earnest and successful clinicians in the same field of medical activity.

It is undoubtedly true that in recent years there has been a rapid extension of the field of indications held to justify the performance of Caesarean section. Indeed it has even somewhat fantastically been suggested that Caesarean section may become an almost universal procedure, normal labor remaining as a rare and accidental phenomenon. Though this result is, of course, not to be considered seriously, such a change in the methods of human life would be hardly more radical than others that have been successfully and advantageously adopted, such as the use of clothing, the cooking of food and the assumption of the erect posture. Caesarean section has not yet been long enough in employment for us to ascertain or appreciate the hereditary effect which it may have upon human structure by enabling the survival of dystocic stocks that otherwise and hitherto have been constantly and relentlessly eliminated by natural process. It is known that morphologic evolutionary changes may occur under favoring conditions within a relatively short time; and it is conceivable that after several generations of Caesarean section in a given family the possibility of normal labor may become completely and permanently eliminated. Such consideration, however, is purely speculative and theoretic and does not concern the question at issue. The problem of Caesarean section to-day is to determine the field of its legitimate present indication, not to contemplate the possible future development of the procedure. Obstetrics will not differ from other branches of modern medicine if it alters the course of evolution by encouraging the survival of forms which

under earlier conditions would have been rigorously and automatically condemned as unfit.

The subject of anesthesia in obstetrics presents another important problem which in recent years has been extensively and conspicuously discussed, by the laity as well as by the profession. The exploitation of so-called twilight sleep in the popular press has probably done a certain measure of harm; for its consideration as one of the methods of obstetric anesthesia legitimately belongs in professional publications. Dr. Brant in his article on anesthesia in obstetrics, reviews, summarizes and compares various anesthetic methods at the disposal of the clinician and states clearly his views as to the indication for their employment. Dr. Irving in the succeeding article presents a detailed exposition of his technique and experience in the employment in obstetrics of one of these methods, that of nitrous-oxide gas and oxygen.

There is, of course, vastly more to be said on the subjects, both of Caesarean section and of obstetric anesthesia, than could be included in a long series of issues of the JOURNAL. It is hoped that the selected papers presented in this number may be of interest not only to obstetric specialists but to those general practitioners who compose the vast majority of obstetricians; and that they may prove also a useful contribution to the growing literature and discussion of these modern problems in obstetrics.

DECREASE OF TYPHOID FEVER IN CALIFORNIA.

In a paper read November 9, 1915, and reported in the *California State Medical Journal* for March, 1916, Dr. Wilbur A. Sawyer, secretary of the California State Board of Health, gave some interesting and stimulating details regarding the campaign against typhoid fever in that state during the last eight years. Owing to many circumstances, of which not the least was the difficulty of getting full reports of non-fatal cases, he concluded that for the present the only reliable gauge of progress in typhoid prevention was the typhoid death rate. The death rate from typhoid per 100,000 population fell steadily in these eight years from 32.2 to 13.6, a reduction of 58%. After the reading of the paper, but previous to its publication, fuller figures for 1915 showed that the actual death

rate from typhoid in that year fell to a point between 9.6 and 9.8 per 100,000. This neatly capped the determination expressed in Dr. Sawyer's paper, that the death rate from typhoid in California would be reduced to a figure below 10 per 100,000 within the next four years. So comes an excellent illustration again of what careful and scientific public health work can accomplish, and how results may easily exceed the most sanguine expectation.

The final figures for 1915 gave a total reduction in death rate from typhoid in nine years of 70% and over the preceding year of 29%.

Sawyer quotes the statistics of the U. S. Bureau of the Census for 1913, the latest available source, showing that in the registration area of the United States, twelve states had a poorer rate than California and eleven a better. The highest was 57.4 in North Carolina and the lowest 7.8 in Vermont. Five states only had death rates for typhoid lower than 10, these being Vermont, Massachusetts, Rhode Island, Wisconsin and New Jersey. California has now joined this enviable group and is planning to proceed still further. Sawyer points out that it becomes increasingly difficult to lower the rate as it approaches zero, yet the effort to control this absolutely preventable disease is one of the finest lines of progress made in modern medicine. The California Board of Health has inaugurated a special campaign for sanitation and typhoid safety in the regions of the great national parks and play-grounds in the state, which are visited by thousands of people from other districts each year. A more efficient determination is also planned to locate the actual place of infection in each case of typhoid to facilitate intensive eradication.

The lowering of the incidence and mortality from typhoid is certainly a matter in which there may be a beneficial competition between states, and it should be a matter of reproach to any state, as to any community, to stand low in such a list.

DIPHTHERIA IN NEW YORK CITY.

A RECENT number of the weekly bulletin of the Department of Health of New York City (Feb. 19, 1916) contains an interesting résumé of the incidence and mortality from diphtheria in the year 1915. A comparative table is given

showing that while there were reported in the years 1907 to 1915, inclusive, 280,078 cases of measles with 6,630 deaths, a percentage of 2.4, and 131,925 cases of scarlatina with 6,474 deaths, a percentage of 4.7, there were 138,042 cases of diphtheria with 13,435 deaths, or a percentage of 9.7. This persisting high death rate from diphtheria and its continuing higher mortality than measles and scarlatina, are worthy of remark.

It is pointed out that since the introduction of antitoxin and its attendant marked fall in mortality rate, there has been practically no change in the death rate from diphtheria. This is ascribed to the fact that the average practitioner does not give antitoxin on the first day of the disease, or as soon thereafter as he sees the case, in spite of the fact that given on the first day there is practically no mortality. Along with this is a failure of the practitioner to make sufficient throat cultures and with proper care for diagnosis. Prompt diagnosis and immediate isolation of contacts and suspects will go far toward reducing the case incidence, as the prompt and adequate use of antitoxin will go far toward reducing the mortality.

The report calls deserved attention to the importance of the Schick intra-dermal reaction to determine the degree of immunization of contacts. With prompt handling of the actual case, and the determination of all contacts whose immunity is low, the quarantine of the disease becomes really accurate. In the use of toxin-antitoxin mixtures for immunization there is much to be hoped for securing finally a means of practical immunization. The administration is effective as a prophylactic for only a few weeks.

For the year 1915 there were 15,572 cases reported with 1,278 deaths, or a mortality of 8.2% as compared with 17,130 cases and a mortality of 8.7% in 1914. In the Diagnosis Laboratory there were examined 51,517 primary throat cultures, of which 8,340 were found positive. Less free antitoxin was distributed in 1915 than in 1914.

The point is worthy of emphasis that in spite of a ready means of accurate diagnosis, and in spite of the availability of a specific cure, the case incidence and case mortality have not shown a greater decrease. This is a matter which can be put squarely back on the practitioner, and it is up to him to make use of the scientific weapons available.

BOYLSTON MEDICAL PRIZES.

For many years, indeed since its foundation in 1826, the Boylston Medical Prize has been one of the most notable prizes in medicine in this country. Until lately this prize has been awarded annually and has carried a premium of \$75. Recently, however, its administration has been so changed that it is now offered triennially with an honorarium of \$300 and the new Boylston Prize Medal which has been made to take the place of the original medal, the die of which was cast at the British mint in London, but which disappeared many years ago and was apparently lost in the Boston fire. The new medal will be of gold, and will be awarded only in case the winning essay shows especial originality in the investigations detailed.

For 1915 the Boylston Prize has been awarded to Dr. Wilson G. Smillie of Cambridge, Mass., for an essay entitled "Studies of the Streptococcus of Smith." For 1918 the prize is offered for the best dissertation on the results of original research in medicine, the subject to be chosen by the writer. Dissertations entered for this prize must be in the hands of the secretary on or before December 31, 1918. This prize is open to public competition. The further conditions upon which the prize is awarded are as follows:

"In awarding these prizes, preference will be given to dissertations which exhibit original work, but if no dissertation is considered worthy of a prize, the award may be withheld. Each dissertation must bear, in place of the author's name, some sentence or device, and must be accompanied by a sealed packet, bearing the same sentence or device, and containing the author's name and residence within. *Any clue by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition.* Dissertations must be printed or typewritten, and their pages must be bound in book form. All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within *one year* after they have been received. By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

"1. That the Board does not consider itself as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

"2. That, in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

"The Boylston Medical Committee is appointed by the President and Fellows of Harvard College, and consists of the following physicians: William F. Whitney, M.D., Chairman; Harold C. Ernst, M.D., Secretary; William T. Porter, M.D., Edward H. Nichols, M.D., Reid Hunt, M.D., Henry A. Christian, M.D., John Warren, M.D.

"The address of the Secretary of the Boylston Medical Committee is Harold C. Ernst, M.D., Harvard Medical School, Boston."

MEDICAL NOTES.

FIRST UNIVERSITY DENTAL SCHOOL IN NEW YORK FOR COLUMBIA.—Realizing the importance of the teeth and mouth infections to systemic disease, the Faculty of the College of Physicians and Surgeons have unanimously voted in favor of the establishment of a dental department, to be connected with the medical school. A committee of prominent dentists of the city have presented plans to the Medical Faculty which have been approved.

The school of dentistry will be closely associated with the medical school and the admission requirements will be the same as the medical. The course will be four years, the first two years the same as those in medicine, thus giving the dental student a thorough knowledge of the fundamental sciences necessary to the practice of a specialty of medicine. At the end of the second year the dental student will give all his time to the study of dental subjects, namely, operative dentistry, prosthetic dentistry, oral surgery and oral pathology, orthodontia, etc., and the more technical part of the work required for the well trained dental surgeon. This new school will be the first university dental school in New York City and the second in the state. It will give the first four-year course of dentistry ever given in the Empire State.

THE EXAMINATION OF CHILDREN IN TRADE SCHOOLS.—Through special arrangement with a representative of the Department of Education in New York City, the Occupational Clinic at 49 Lafayette Street, is now conducting physical examinations of girls who are serving an apprenticeship in the Department of Education's extensive trade rooms for industrial workers. The girls in this school remain but a short period, and each week a number of new applicants are initiated into some special vocation such as millinery, dressmaking, designing, etc., to ascertain the aptitude and suitability of the girls for particular vocations. As soon after they are admitted as possible, the girls are sent to the Occupational Clinic of the Division of Industrial Hygiene, and a physical examination is made to discover whether they show any

physical defect of a character which would disqualify them for such vocation as they may tentatively have selected. It is intended to discover whether these girls are unfitted by a cardiac, nervous or orthopedic defect for entering a trade that would tax their physical capacity, and to assist the instructors to guide them into vocations which are compatible with their physical state.

If this sort of coöperation between educators and physicians to guide those on the threshold of industrial life in a selection of a trade in which the strains and demands are of a character that the individual is mentally and physically adapted to meet is developed, as it should be, a conservative system will have been introduced into the industrial world. At present children are guarded and guided while at school and until they receive working papers; after this, they pass beyond medical control and supervision. The department now inaugurated in coöperation with the Department of Education, may open up a wide field to extend the supervision over minors who enter the industrial field, and thus continue the state's medical guidance to cover an additional important period of the life of our young citizens.

LONDON DEATH RATES IN JANUARY.—Statistics recently published show that the total death rate of London in January, 1916, was only 13.5 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 19.9 in Shoreditch, a crowded East Side slum, and the lowest was 10.3 in the old City of London. It is surprising that the two extreme rates should have occurred in adjacent districts.

TYPHUS FEVER IN MEXICO.—Twelve cases of typhus fever have been reported in Texas. These cases have occurred mostly at Mexican border points.

APPROPRIATIONS BY THE ROCKEFELLER FOUNDATION.—The Rockefeller Foundation has recently made appropriations amounting to \$1,200,000 for various branches of its activities. These cover the work of the department recently established at Princeton, N. J., the study of animal diseases, the Union Medical College in Peking, China, the aiding of the hospital work of Alexis Carrel in France and of the prison camps of Europe. The Rockefeller Institute has recently sent Dr. Alvin W. Struse of Philadelphia to the tropics to make a general survey and study of tropical diseases and of snake bites and poisons in India. He will be associated with Dr. Victor G. Heiser of the Philippine Islands. Dr. Struse will visit the Hawaiian Islands, India, the Fiji Islands, the Federal States, Australia and the Island of Ceylon, spending at least two years in the study.

WAR RELIEF FUNDS.—On March 25 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	\$108,962.93
Serbian Fund	84,506.46
Allied Fund	68,703.30
French Wounded Fund ...	64,039.85
Armenian Fund	35,662.16
French Orphanage Fund ..	34,041.09
Polish Fund	26,765.90
Surgical Dressings Fund ..	20,886.17
La Fayette Fund	19,635.53
Italian Fund	16,525.35
P. S. D. Fund	6,024.45

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending March 25, there were 234 deaths reported, with a rate of 16.05 per 1,000 population as compared with 273 and a rate of 19.02 for the corresponding week of last year. There were 34 deaths under 1 year as compared with 36 last year, and 77 deaths over 60 years of age against 90 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 48; scarlet fever, 70; measles, 151; whooping cough, 38; typhoid fever, 1; tuberculosis, 32. Included in the above were the following cases of non-residents: Diphtheria, 12; scarlet fever, 23; whooping cough, 1.

Total deaths from these diseases were: Diphtheria, 1; measles, 1; scarlet fever, 1; typhoid fever, 1; tuberculosis, 17. Non-residents included in the above: Typhoid fever, 1; tuberculosis, 1.

MONSON STATE HOSPITAL.—The report of the trustees of the Monson State Hospital covering the year ended November 30, 1915, states that the average number of patients cared for was 974, the number of discharges 85, and the number of deaths 69. An out-patient department has been opened in connection with the regular work of the hospital. A representative of the medical staff is at the Academy of Medicine in Springfield on the first and third Wednesdays of each month, at Greenfield Hospital on the second Monday of each month and in Pittsfield at the House of Mercy on the last Thursday of each month.

BRAIN SYPHILIS IN INSANE HOSPITALS.—On November 3, 1915, the Massachusetts State

Board of Health appointed Dr. Harry C. Solomon as special investigator of brain syphilis and the March bulletin (No. 19) of the Board records progress in his work up to March 1. At the Danvers State Hospital there are being treated eight cases of brain syphilis diagnosed as general paralysis. On the first of December the Westborough State Hospital began treatment with one case. Since then they have treated five more cases with intraspinal and mercurial serum and several cases with salvarsan substitutes. At Taunton State Hospital two cases have recently been taken under treatment with a drug furnished through the courtesy of Dr. Danysz of the Pasteur Institute of Paris. This drug goes under the trade name of "Luar-gol," and is a compound of dioxidiarminoarsenobenzol with bromide salts of silver and antimony. Wassermann specimens had been previously taken of 1,000 cases at the Massachusetts School for the Feeble-minded at Waverley, and the entire population has now been examined, and, in addition, the cerebrospinal fluid in all cases that had positive Wassermann reaction. Twelve are being given treatment, six with salvarsan and six with salts of mercury. Three cases at Worcester State Hospital are being treated with arsenobenzol, which is the American substitute for salvarsan. At the Medfield State Hospital five cases are receiving intravenous arsenobenzol, several are receiving intravenous injections of mercury and a group of latent syphilites are receiving intramuscular injections of mercury. Patients are being treated at Boston State Hospital with intravenous arsenobenzol, intraspinal mercurialized serum and intraspinal arsenobenzolized serum. There are thirty-six cases of brain syphilis being treated at the Psychopathic Department.

OCCURRENCE OF ANTHRAX.—Several cases of anthrax recently occurring in Woburn, Chelsea and Peabody have called attention to the great danger of contraction of the disease which has sprung up since the opening of the European War. The infected hides come to this country, for the process of tanning, from China and India. They were formerly tanned in Germany and it is only since the outbreak of the war that the disease has become dangerous in this country. In Woburn the disease has occurred in two tanneries and two deaths have resulted, although the tannery using the greatest number of Chinese hides has had no fatalities. An employee in a Chelsea tannery has died at the Massachusetts General Hospital and three more cases are being treated there. Both the State Department of Health and the local health officials are making every effort to control the disease. Two additional cases of anthrax were reported at Woburn on March 24.

FINANCIAL STATUS OF DISPENSARY PATIENTS.—The Boston Dispensary reports its results of

an investigation of the wage earning capacity of its patients. The following figures are given:

"Fully three-fourths of all our patients belong to family groups, and more than three-fourths of these families have but one wage earner. Thirty-seven per cent. of families live on \$600 or less, 49% on \$700 or less, 70% on \$800 or less, 77% on \$900 or less, 83% on \$1000 or less per annum; 3% are dependent on charitable relief; 14% have over \$1000, *i.e.*, not more than 1400 new families a year have more than \$1000, while 8000-9000 have less than \$1000.

"Among those listed as 'unmarried,' about 4000 new patients a year, 78.6%, are living on \$600 or less a year, *i.e.*, only between 700-800 unmarried applicants out of 4000 earn over \$12 a week.

"It is a general opinion among students of wage-earners' budgets that even small families in this vicinity living on \$1000 or less a year should not be expected to purchase more medical service than that necessary to childbirth and acute illness in the home."

NEW ENGLAND BAPTIST HOSPITAL.—The 22nd annual report of the New England Baptist Hospital, Boston, records a total of 742 patients treated for the year ended December 31, 1915. Seventy-five of this number were medical cases, 546 surgical cases and 87 maternity cases. There were 226 major operations performed and 271 minor operations. The training school numbers 26 nurses. Ten nurses were graduated during the past year.

APPOINTMENTS IN THE MEDICAL RESERVE CORPS.—The following Boston doctors have been nominated by President Wilson to the rank of first lieutenant in the Medical Reserve Corps: Gardner Nathan Cobb, Horace D. Arnold, Alexander S. Begg, John Warren, Frank P. Williams, Z. B. Adams and Elliot G. Brackett.

BEQUEST.—By the will of the late Edward Everett Allen of Watertown, Mass., the Boston Floating Hospital is the recipient of \$500, and the Watertown District Nursing Association, \$1000.

Massachusetts Medical Society.

IMPORTANT LEGISLATION.—The enemies of public health are making a desperate attempt to break down our vaccination and legislative laws. House Bill 1088, that unvaccinated children may attend public schools, is now in the Legislature. House Bill 1091, giving exemption from registration, and 1093, on the practice of mid-wifery, may be reported at any time. Members of The Massachusetts Medical Society should see their senators and representatives immediately and secure their influence against these measures.

CHARLES F. WITHINGTON, *President*.

Obituary.

SILAS ARNOLD HOUGHTON, M.D.

DR. SILAS A. HOUGHTON of Brookline, Mass., died Sunday, Feb. 6, of pneumonia, after an illness of less than a week. He was born in Keeseville, N. Y., September 11, 1864, was prepared for college at the Boston Latin School, entered Harvard College in 1883, and graduated four years later, having laid the foundation among his classmates for their future lasting regard. He entered the Harvard Medical School, receiving his degree in 1891. He thereafter served as house officer at the Boston Lying-in Hospital and at once began the practice of medicine in Brookline, for a time being associated with Dr. George K. Sabine of that town. Dr. Houghton was married in 1897 to Miss Margaret S. Beckwith of Plattsburg, N.Y., who, with two children, a son and a daughter, survives him. He was a member of the American Medical Association, the Massachusetts Medical Society, the Boston Obstetrical Society, the Boston Medical Library and, at the time of his death, was one of the officers of the Harvard Medical Alumni Association.

Dr. Houghton was widely known in the community in which he practised as a physician of judgment and conservatism, never led away by the vagaries into which medical practice is at times liable to wander. He was, perhaps, especially known as an obstetrician of unusual skill, although he never devoted himself solely to this branch of practice. Of late years, in fact, the exigencies of his general work and the necessity of conserving his energies for this purpose, led him to give up this exacting field of practice in which he had attained an enviable success. He was eminently a family practitioner, deeply interested in people, and gave much more than his professional skill in his relations with his patients. He regarded his work as service in the most comprehensive sense of that term, and it may be assumed that the return which he received was quite inadequate to the time and devoted interest which he ungrudgingly gave. He felt strongly on many subjects and especially never failed to express his contempt for what he regarded as a mercenary tendency in medical practice. The idea of medicine as a source of profit was wholly alien to his mind. Although our faith at times may be shaken, the spirit of sacrifice will doubtless remain one of the best traditions of the profession of medicine, but it is indeed rare to find it exemplified in so modest and sincere a form as with him.

His main interest throughout his active life was his profession, but the same loyalty which he gave to it, found expression also in his devotion to his friends. Those who happened to be of the group of medical men who were associated with him first at college, and later at the medical school, will cherish the memory of his enthusiasm, his good fellowship and his loyal devotion to the interests of the club which they constituted. For some years past his summers have been spent at Essex, on the western shore of Lake Champlain, a region endeared to him by many associations. His fine gift for hospitality there found ample expression, as many of his friends can attest. Perhaps the most striking testimonial of the high regard in which he was held by all classes of the community in which he lived and did his work, was shown by the outpouring of people at the simple funeral services held at his house. He contributed little to the literature of medicine, but his claim to lasting recognition rests on the much firmer foundation of modesty regarding his attainments, perfect loyalty to his friends, his patients and his ideals, and a conscientious performance of the daily task of ministering to the afflicted, whether in body or spirit. His death leaves in many a family circle a peculiarly personal sense of bereavement.

Correspondence.

COMMITTEE ON STATE AND NATIONAL LEGISLATION.

BOSTON, MASS., March 13, 1916.

Mr. Editor: In the latest number of the JOURNAL there is a letter from Dr. Frank E. Lewis of Nantucket referring to the lack of opposition by the medical profession to a bill allowing the registration of "herb doctors."

Dr. Lewis says, "There should be committees appointed to meet these exigencies." He is probably not aware that the Committee on State and National Legislation of the Massachusetts Medical Society works unceasingly on these bills, but through a misunderstanding between the committee and the Board of Registration in Medicine no opponents appeared before the Public Health Committee. Through the intervention of the Committee on State and National Legislation a second hearing was granted at which physicians familiar with the subject were present and spoke in opposition.

Physicians may be apprised of legislative matters affecting public health through the columns of the BOSTON MEDICAL AND SURGICAL JOURNAL, and, if particularly interested, may subscribe to the *Legislative Bulletin* by sending their names and addresses, accompanied by two dollars for each subscription, to the Sergeant-at-Arms, State House, Boston.

Very truly yours,

WILLIAM H. ROBEX, JR., *Secretary*,
Committee on State and National
Legislation, The Massachusetts
Medical Society.

SOCIETY NOTICES.

HARVARD MEDICAL SOCIETY.—Historical Club Meeting in the Peter Bent Brigham Hospital Amphitheatre, Tuesday evening, April 4, at 8.15 o'clock.

PROGRAM.

"Medical Men Who Have Loved Music," Dr. Fielding H. Garrison of Washington, D. C.

"The History of the Discovery of the Secretary Glands and Their Function," Dr. Mortimer Frank of Chicago.

Medical students and physicians are cordially invited to attend.

ERNEST G. GREY, M.D., *Secretary*.

BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.—A meeting of the Boston Society for Medical Improvement will be held in Sprague Hall, Medical Library, on Monday, April 3, 1916, at 8.15 P.M.

Memorial addresses:

Dr. David Williams Cheever.

By Dr. George W. Gay

Dr. John Collins Warren

Dr. James Clarke White.

By Dr. Abner Post

Dr. Frederick C. Shattuck

Friends of Dr. Cheever and Dr. White and members of the Suffolk District Medical Society are cordially invited.

Dr. HERMAN F. VICKERY,

President.

Dr. GEORGE G. SMITH,

Secretary.

RECENT DEATHS.

DR. WISNER ROBINSON TOWNSEND, of New York City, for many years secretary of the Medical Society of the State of New York, and a well-known orthopedist, was found dead in the area of his home, 125 West 58th Street, March 12, he having fallen through a low-silled window during the night. Dr. Townsend graduated from the College of Physicians and Surgeons, Columbia, in 1880, and served his apprenticeship as house officer in Bellevue Hospital. He held these positions: Associate surgeon, Hospital for Ruptured and Crippled; orthopedic surgeon, French Hospital; consulting surgeon, S. B. Smith Infirmary, and other hospitals. He was a member of the American Orthopedic Association and of the New England Association of Railway Surgeons and at one time was a member of the Board of Trustees of the American Medical Association. He was sixty years old.

DR. NATHAN GROSS BOZEMAN, who died of pneumonia on March 17, in New York City, was born at Montgomery, Ala., on Feb. 13, 1856, the son of Dr. Nathan Bozeman, chief surgeon on the staff of General Stonewall Jackson in the Confederate Army. The junior Dr. Bozeman was a graduate of the University of Virginia, studied medicine at Paris and Vienna and had been a distinguished practitioner of surgery and gynecology at New York City.

DR. EDWARD RANDOLPH PEASLEE FOURTIN, a Fellow of the Massachusetts Medical Society, died of heart disease at Waltham, March 15, 1916, aged fifty years. He was a native of South Amesbury, and was a graduate of the Harvard Medical School in 1891. Following graduation, he practised in Butte, Montana, when he came East and served as house officer at the State Hospitals at Tewksbury, Foxboro and Monson, finally settling at Waltham. He had been in poor health for a year. He is survived by two daughters.

The Boston Medical and Surgical Journal

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Preventive Medicine.

PRACTICAL POINTS IN THE PREVENTION OF ASIATIC CHOLERA.

By SURGEON ALLAN J. McLAUGHLIN, BOSTON,

United States Public Health Service; Commissioner of Health, Commonwealth of Massachusetts.

THE subject of cholera is so broad, the research work and knowledge acquired is so vast and its literature so voluminous, that it seems desirable to limit a paper of this character to the practical essentials in preventing the entrance of Asiatic cholera into clean territory and preventing its spread if it should succeed in passing quarantines. I will omit its interesting history, symptomatology and treatment, and confine myself to a discussion of the two points which are of the greatest practical significance, viz.: the cholera carrier and the bacteriologic diagnosis of Asiatic cholera.

With a thorough knowledge of the cholera carrier and the bacteriologic technic of cholera diagnosis, the prevention of cholera becomes easy, and all our efforts must be based logically on these two fundamentals.

(a) KNOWLEDGE OF CHOLERA CARRIERS.

Cholera carriers were first demonstrated in the Hamburg epidemic of 1893, and this demonstration was used by some to combat Koch's claim that the comma bacillus was the real cause of cholera. The presence of cholera vibrios in

healthy persons was looked upon by many as an interesting fact, with little epidemiologic significance, for years after the absolute specificity of the cholera vibrio had been universally accepted.

The writer has the privilege of observing the work of the German sanitary officers during the outbreak of cholera in Germany in 1905, and of working in the laboratories of the Institut für Infektionskrankheiten in Berlin. On the Stolpe estate, near Berlin, an outbreak of cholera appeared among Hungarian laborers—one hundred and ten persons were placed under observation—and examination of their stools showed five "bacillus carriers." During the months of September and October, 1905, two hundred and twelve cases of undoubted cholera were diagnosed bacteriologically, and about 12% of these were healthy bacillus carriers.

During the cholera epidemic in Manila in 1908, I found that the general impression was that "bacillus carriers" were interesting scientific curiosities, without much effect upon the spread of the disease. With my German experiences in mind, I was not ready to accept this position, and instituted a search for "carriers." When a case of cholera was found, the stools of all the inmates of the house and many of the inmates of the surrounding houses were examined. The amount of work which could be done was limited by lack of funds and personnel in the Bureau of Science, but in September, October and November three hundred and seventy-six healthy contacts were examined, and twenty-seven "carriers", or about 7%, were found.

The writer also believed that the bacillus carrier was the logical explanation of the mysterious outbreaks which occurred almost annually in Bilibid Prison. Bilibid Prison is one of the finest institutions of its kind in the world. From the standpoint of discipline and control of its inmates it stands almost unrivalled. There is absolute control of the food and water supply, and ordinarily no fresh milk is used in the institution. The appearance of cholera in such an institution seemed inexplicable, as the following extract from the Annual Report of the director of health for 1906 shows:

"A case in an institution which is practically cut off from the remainder of the world; where all food-stuffs are permitted to enter only after the most rigid inspection; where all food served that could likely convey cholera is cooked at all times, and, on account of dysentery, it is said that all drinking water was sterilized; it would seem that the routine precautions thus taken should also have afforded protection against cholera. The commencement of an outbreak in this insidious manner was puzzling to the sanitary authorities, and the prospects of combating a disease whose origin was so obscure were not encouraging."

When the writer took charge of the Bureau of Health, in August, 1908, cholera was present in Manila and epidemic in the surrounding provinces. In September the disease assumed epidemic proportions in Manila and broke out in Bilibid Prison. The precautions taken in Bilibid Prison were even more rigid than formerly, in regard to water and food, and the prohibition of vegetables, fruits and fresh milk. Each incoming prisoner was placed in quarantine for five days and his stools were examined for intestinal parasites, but not for cholera. Owing to the pressure of work incident to the epidemic it was deemed impracticable to examine the stools of over three thousand prisoners, but those of two hundred and sixty-four prisoners were examined, with the following results:

BILIBID PRISON.

Number of healthy persons examined	264
Number of persons carrying cholera vibrios	17
Percentage of bacillus carriers among healthy individuals	6.44

The outbreak was quickly suppressed in Bilibid Prison following an order by the writer to compel thorough disinfection of the hands under guard upon leaving the latrines and before eating.

These experiences prompted the writer to make the statement¹ that "The most important rôle in the transmission of cholera is played by the bacillus carrier." Subsequent experiences in the Philippines bear out this view, and in the last two years increased appropriations and personnel have enabled the Bureau of Science to extend greatly the search for carriers, with splendid results.²

The writer has never known a bacillus carrier to harbor cholera vibrios for longer than twenty days, and the great majority lose their vibrios in less than ten days. However, many observ-

ers have found them present for longer periods, although all agree that the long-time carrier is the exception and not the rule. The following are the longest cited by Pfeiffer³:

PERSISTENCE OF CHOLERA VIBRIOS IN STOOLS OF CONVALESCENTS, OR BACILLUS CARRIERS.

Name of Observer	Longest Duration of Days
Guttman	10
Lazarus and Pulicke	12
Michailow	12
Simonds	18
Rumpel	24
Rommelaere	47
Kolle	48
Donitz	49
Abel and Clausen	15
Pfeiffer	13
Bürgers ⁴	69

Gaffky,⁵ at the extraordinary session of the Permanent Committee of the International Sanitary Bureau, held at Paris, March, 1911, reported a case in Germany who, after six months of observation, still passed vibrios in his stools. This suggests that such chronic carriers may have infection of the gall-bladder and biliary passages. In fact, Zirolia,⁶ reports that in two cases vibrios reappeared in the stools after negative periods of twenty days and one month respectively. Such intermittency is scarcely possible without infection of the biliary apparatus. Zirolia observed further that, after a saline purgative, vibrios reappeared in a case which had been negative for three weeks. Kulescha⁷ found that the cholera vibrio could be detected in the gall-bladder in 10% of the cases, producing some lesions and propagating in the biliary passages.

Kulescha also reports a case of cholera, sick November, 1908, who recovered and was discharged from hospital in January, 1909, after having had vibrios continuously in his stools for fifty-seven days. He re-entered the hospital in October, 1909, with hepatic trouble, and died October 24, 1909. After autopsy cholera vibrios were found in the biliary passages. It is, of course, impossible to exclude the possibility of a re-infection, but Kulescha believes that the vibrios persisted from the time of his cholera illness in November, 1908.

It is, therefore, certain that we have long-time carriers in cholera as in typhoid, and this is probably due to infection of the biliary apparatus. These long-time carriers make a farce of the ordinary five-day quarantine detention without stools examination, which was considered formerly a sufficient guarantee for safe discharge from quarantine, provided no signs of illness developed. In the Philippines, in 1908 and 1909, the writer, as a requirement for discharge of contacts from quarantine, substituted a negative examination of the intestinal discharges for the ordinary five-day detention period.

In October, 1910, the writer recommended to the Surgeon-General that the intestinal discharges of all arrivals at United States ports,

from territory infected or suspected of being infected with cholera, should be examined bacteriologically, and that discharge from quarantine be made only after a negative result of the stools examination. On July 19, 1911, the Secretary of the Treasury promulgated a regulation providing for this additional safeguard.

Rapid methods of technic and an efficient system of collecting samples and handling the specimens make it possible for one person to examine from one hundred to one hundred and fifty stools per day.

This important advance in our methods of Asiatic cholera quarantine not only gives us an additional safeguard in preventing the entrance of vibrio-carriers, but makes possible the shortening of the period of detention from five days to two or three days.

Frank cases of cholera present little difficulty in diagnosis and are very much less of a menace in the spread of cholera than the carrier. Atypical cases, however, are much more serious as an epidemiological factor. The writer, in Manila, showed the frequency of these atypical cases in children,⁸ and it is reasonably certain that they are common at all ages. These cases, like the healthy carriers, are unsuspected, and go undiscovered unless bacteriologic examination of the stools is made.

These facts concerning healthy carriers demonstrate clearly that the bacteriologic diagnosis is our sheet anchor in preventing cholera, and it is the only means of diagnosis upon which one can rely.

(b) BACTERIOLOGIC DIAGNOSIS OF ASIATIC CHOLERA.

The limits of this paper do not permit a detailed, complete description of the bacteriologic diagnosis of cholera. These details were given by the writer in this JOURNAL⁹ and in Reprint No. 53 of the Public Health Reports of the U. S. Public Health Service, November 4, 1910.

I desire to accentuate the simplicity of the technic of cholera diagnosis and to mention some of the useless procedures to be avoided.

The diagnostic procedures in Asiatic cholera may be limited to the securing of, from the faeces, a discrete colony or pure culture of a vibrio and its agglutination by an anti-cholera serum of a high titer. The agglutination should be performed with a serum of a titer of at least 1 to 4000, and no weaker dilution than 1 to 1000 used as a final test. Pfeiffer's phenomenon, complement fixation, and other biologic reactions are useful aids, but are unnecessary for the simple diagnosis of cholera.

In frank cases of cholera in the first three days of the disease, direct smears of fecal material on ordinary agar plates will usually give discrete cholera colonies (within fifteen hours without enriching media). Enriching fluid should always be used, however, as the vibrios are often scarce in carriers or in cases of more than five days' duration. Very good results in detecting carriers are given by the peptone-

enriching media, according to the formula of the German Imperial Health Office.

Avoid the use of gelatin; it is difficult to handle, especially in the tropics, and has no compensating advantage. Use agar plates, ordinary 3% agar, neutral to phenolphthalein. The so-called cholera red reaction is valueless. Undoubted cholera strains sometimes fail to give it where certain brands of peptone are used. More important still, many non-cholera vibrios produce the cholera red in peptone solution.

Hanging drop procedures are time-consuming and of little value. You may discover that the organism is motile, but if it is a cholera vibrio its motility will prevent anything but a guess as to its morphology. Even if you have satisfied yourself that it is a motile vibrio, you must remember that there are dozens of motile vibrios morphologically and culturally indistinguishable from cholera.

The literature is full of the hemolytic type of cholera vibrios, and discussions of the so-called El Tor vibrio. These hemolytic strains of the German writers were practically all old laboratory cultures. Some reports have been made of peculiar reactions of some vibrios to serum of known agglutinative strength. These have either been old laboratory cultures or vibrios isolated from water which probably had been living in unfavorable environment. Many papers have been written which tended to show variation in the morphology of the cholera vibrio. These again were found in cultures kept on artificial media for weeks and months.

With Major E. R. Whitmore,¹⁰ U. S. Army, the writer made a long series of tests with many cholera and non-cholera vibrios in Manila. These were freshly isolated strains and represent what you are likely to find in actual conditions in epidemic times. We never found a freshly isolated cholera vibrio which was affected even in dilutions of 1 to 10 by any serum except anti-cholera serum. All freshly isolated cholera vibrios gave an instantaneous agglutination in anti-cholera serum 1 to 200 and in 1 to 1000 in one hour, strength of serum of a titer of at least 1 to 4000.

We never found a cholera vibrio freshly isolated from the human body which showed hemolytic properties, or any marked variation in morphology.

While these variations and peculiarities are found in laboratory cultures or strains isolated from water, the practical point is that you will find in the strains freshly isolated from the human body, normal, orthodox cholera vibrios, which will respond to your agglutination tests in a normal and orthodox manner.

In addition to ordinary laboratory equipment you will need for the bacteriologic diagnosis of cholera only the following:

- Cholera material.
- Agar plates.
- Peptone solution.

Anti-cholera agglutinating serum, of a titer not less than 1-4000.

Your cholera material is planted in peptone solution and placed direct on agar plates. Plates are streaked from the peptone solution after three, six, or twelve hours. The vibrio colony is tested in drops of 1-200 cholera serum on a glass slide, for quick diagnosis, to be confirmed by a quantitative agglutination to the limit of agglutinability later.

IMPROVEMENT OF MEDIA.

One other advance in our methods of handling Asiatic cholera suspects has been made by Goldberger,¹¹ which promises to increase our efficiency in detecting Asiatic cholera carriers when making stool examinations on a large scale.

There has been no great change in the bacteriologic methods of Asiatic cholera diagnosis in the past ten years, and these methods are based upon the procedure of the German Imperial Health Office. They are efficient and adequate for the prompt diagnosis of Asiatic cholera, and the detection of cholera carriers, provided that there are plenty of vibrios in the stools and provided also that there is plenty of time to make the examination.

From the point of view of the practical quarantine officer the maximum protection of the public health must be afforded, with the minimum restriction of commerce. Here the time factor is of such importance that all cumbersome methods and unnecessary corroborative technic must be eliminated. The simplified and systematized methods successfully employed by the U. S. Public Health Service are efficient in detecting promptly Asiatic cholera cases or cholera carriers with numerous vibrios in their stools, but it is quite possible that the examination in the case of a carrier with very few vibrios in his discharge might prove negative.

As a time saving measure, test tubes are used instead of large flasks for the peptone solution. This necessitates that the amount of feces added to the tube must be small, and if the vibrios are very scarce a carrier might be recorded as negative. Large flasks and many platings are impracticable on a large scale, where the daily examinations may run into thousands. Goldberger's media permit the planting of relatively large quantities of feces, using the same convenient size of test tubes.

Goldberger suggests two enriching solutions, an alkaline egg peptone, and an alkaline meat infusion peptone. The cholera vibrio grows well in both solutions, though less luxuriantly than in ordinary cholera peptone. The multiplication of the ordinary fecal bacteria is markedly restrained, especially the colon bacillus. Goldberger's work shows that in his media the vibrios, if present even in small numbers, will increase and not be overgrown, even after seventy-two hours.

Goldberger's media were devised after a careful study and test of the various selective media suggested by Dieudonné, Neufeld and Worthe, Esch, Pilon, Crenderopoulo and Panayotatou, Krumwiede, Pratt and Grund, Hoffmann and Kitscher, Moldavan and others.

The addition of Goldberger's media to our equipment should make the passage of an Asiatic cholera carrier through our quarantines still more unlikely. It is true that these media have not yet been tested in actual field work, but the laboratory tests suggest that they are the most valuable addition to our cholera technic which has been made in recent years.

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RECENT LITERATURE ON THE TREATMENT OF CHOLERA.

RESULTS OF THE TREATMENT OF 69 CASES OF CHOLERA BY ROGERS' METHOD.

SINTON (*Ind. Med. Gazette*, August, 1915) treated 69 cases of cholera during the summer of 1914, with a mortality of 21.7% as compared with a general mortality for the epidemic (1162 cases) of 76.1%. The treatment given was that advocated by Sir L. Rogers. To combat collapse intravenous injections of hypertonic salt solution were given. In the adult an initial injection of about three pints was usually required before a pulse of good tension appeared at the wrist, but in some cases as much as five pints were needed. When possible, the effect of the initial dose was kept up by rectal injections of isotonic saline given hourly. The indications for injection were weak pulse, cyanosis and restlessness (especially if accompanied with severe cramps), suppression of urine lasting more than 14 hours, severe vomiting and diarrhoea. Collapse was also combated with injections of strychnine, pituitrin and adrenalin hypodermically. Thirty-one of the writer's cases did not require saline injection. These cases were put at once on the permanganate treatment, the object of which is to destroy toxins in the bowel. All cases received this sooner or later. Two grains of potassium permanganate were given every fifteen minutes for eight doses, and then every half hour for four more doses if the stools were not already green. On the next day eight more doses were given at half-hour intervals, and in bad cases on the third day also.

The commonest complication observed in these cases was uremia, which was treated by injections of isotonic saline, digitalin, strychnine, adrenalin and pituitrin, also hot fomentations and cupping over the kidneys.

In the 38 severe cases (those requiring saline injection) the mortality was 37%, as compared with 83% among all untreated cases during the same period.

[L. D. C.]

Original Articles.

FERMENTATIVE DIARRHEA IN INFANTS (CARBOHYDRATE FORM).*

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THE diarrheas of infancy may be divided into three classes:

1. *Infectious Diarrhea*, due to infection of the intestinal mucous membrane with bacilli of the dysentery or streptococcus group, or possibly with the bacillus aerogenes capsulatus. A severe disease, accompanied usually by much prostration, and with pus, blood and mucus in the stools.

2. *Nervous Diarrhea*, due to increased intestinal peristalsis, caused by influences which disturb the nervous equilibrium of the child.

3. *Fermentative Diarrhea*, caused by the excessive decomposition of either carbohydrate or proteid material in the intestine. The word "fermentation" is here used in its broadest sense, synonymously with "decomposition."

(a) *Proteid form*: a condition due to the excessive decomposition of proteid in the intestine. No blood or pus usually in the stools, and not much prostration. The stools are brown, foul, rather large and mushy, and are always alkaline in reaction. The diarrhea usually clears up with a few days of low proteid and high carbohydrate diet. Not a very common condition.

(b) *Carbohydrate form*: the common diarrhea of infants; caused by excessive decomposition of carbohydrate in the intestine. It is with this last condition that I wish to deal.

Stools: The number of the stools varies. There may be as few as 3 or as many as 15. The stools may vary a good deal in appearance; if they are few in number they may be yellow and rather mushy and spongy; they may be bright yellow, of the consistency of scrambled eggs, with a good many small fat curds, or they may be bright green, and very loose and watery, with or without casein or fat curds. It is not exactly clear what causes the bright green color of the stools, but it is probably due to an oxidation of bilirubin to biliverdin. Normally, in the intestine, the bilirubin present is reduced to hydrobilirubin, or remains as bilirubin, but under the influence of excessive fermentation it is oxidized to the bright green biliverdin. In diarrhea due to carbohydrate fermentation, there is rarely any blood present. The reaction of the stools is *always* acid, and a good nose can nearly always detect the characteristic odor of acetic or butyric acids.

There may be a good deal of tenesmus and straining, and, in severe cases, even prolapse of the rectum. The general condition of the child, in the milder cases, may be good, or in the more severe cases there may be a good deal of prostration, with moderate fever, seldom over 101°. There may be vomiting, but this is not a prominent symptom, and except in the more severe cases the stomach is not particularly irritable. The buttocks are usually red and irritated.

The *diagnosis* of diarrhea due to carbohydrate fermentation is usually not difficult. It must be remembered that the condition is due to one thing: a fermentation of carbohydrate in the intestine and excessive acid production, with consequent irritation to the mucosa, and increased peristalsis. Hence the stools are always acid. Occasionally the more serious condition, infectious diarrhea, may start in with fermentation, and the only way to distinguish a case of this sort is to watch it for a few days. If it is one of infectious diarrhea, the temperature generally continues elevated, and blood usually appears in the stools. Ordinarily, it is not difficult to distinguish between the two, and nearly all cases of diarrhea with strongly acid stools are of the carbohydrate type.

Etiology. In the infant's intestine there are always two forces working against each other: decomposition of carbohydrate and of protein. If the former preponderates the stools are acid; if the latter, they are alkaline. In a healthy bottle-fed child there is a balance between the two: the stools may be slightly acid, slightly alkaline, or neutral, and if any one of these three conditions obtains, there is no diarrhea—it is only when the balance is upset that trouble results. Many factors enter into the abnormal fermentation of carbohydrate in the intestine, and it is probable that no one factor is the cause; it is rather a resultant of several conditions, and only the more important ones will be taken up in this paper. In the words of the late Christian Herter,¹ "The character of the products formed in the digestive tract under the influence of micro-organisms is influenced by a variety of conditions: by the chemical nature of the food, by the quantity and composition of the digestive juices, by the rate of absorption, and by the state of the motor functions of the stomach and intestine. It does not require a highly developed imagination to see how complex must be the conditions which enter into these bacterial activities, and how hopeless is the task of tracing the precise influence of each of these factors."

In any discussion of the etiology of fermental diarrhea in infants, heat occupies a prominent place: it favors the growth of deleterious organisms in the milk ingested, and it also lowers the resistance of the child. It has always seemed to me that the practice that so many of our foreign population have, of dressing their

* Read at a meeting of the New England Pediatric Society, Dec. 10, 1915.

babies too warmly in the hot weather, is also an influence in causing diarrhea.

Food. The three conditions in the food that are important are the following:

1. Too high a sugar percentage in the food. In this connection it should be remembered that the different sugars are not alike in the ease with which they are fermented, and that the maltose is the least easily fermentable. Also, the relation between the sugar and protein in the food is important; a high sugar and a relative low protein percentage favors acid production.

2. Too much food at a feeding, thus causing an excessive amount of carbohydrate to be thrown into the intestine at one time. It cannot be absorbed, and what is not absorbed, is likely to ferment.

3. Bad milk. In summer, the possibilities of milk infection are, of course, great. The ordinary lactic acid fermentation, or "souring," of milk, does no real harm to the milk as a food, and milk "soured" with the lactic acid organism does not cause diarrhea. Lactic acid in small amounts is not harmful to the intestine, and in the ordinary "souring" of milk the fermentation does not go beyond the lactic acid stage. The danger comes when such organisms as *b. coli*, *b. acidophilus*, *b. proteus*, etc., get into the milk. These organisms produce a different sort of fermentation than does the lactic acid bacillus, and form the volatile fatty acids, such as formic, acetic, and butyric, from the carbohydrate in the milk, and, of course, carry on their activities in the intestine, although a good many of them are probably killed before they reach the intestine, by the hydrochloric acid of the stomach.

It is these acids, especially acetic, which are harmful. It is probable that no one micro-organism is entirely responsible for the formation of volatile fatty acids from sugars in the intestine, the bacterial flora there being so varied, and the possibilities of a varied milk infection being so great, that it would be hard indeed, to lay the blame at the door of one organism. The bacillus proteus, the bacillus perfringens (Tissier), the bacillus Flügge of the Germans, and the bacillus aerogenes capsulatus have all been given importance by different investigators, and by different pediatric schools—but it may be said that the problem is an extremely complicated one, and that our knowledge of the exact parts played by these various organisms is as yet very imperfect.

From a study of the literature and from my own observations on the Boston Floating Hospital and in the Out-Patient Department of the Children's Hospital it seems fair to assert the following regarding the cause of (carbohydrate) fermental diarrhea:

Fermental diarrhea is due to excessive production of volatile fatty acids by bacterial fermentation of carbohydrate in the intestine. A number of factors coöperate in causing it: a

food excessively rich in carbohydrate, or a food in which the ratio of the carbohydrate to the protein is too high, or a food fed in excessively large amounts. The powers of digestion and absorption of the individual baby, and the relation between the digestive juices, also play an important rôle. The normal flora of the intestine may, in summer time, be greatly augmented by the introduction of more bacteria of the same or different sorts, in the milk ingested, and even if there is only a relatively small amount of carbohydrate present in the intestine, it ferments, due to the greater variety and mass of bacteria.

The chemistry of fermental diarrhea is most interesting, and it is necessary to understand the essential chemical processes at work, in order to understand the principles of treatment. As we have said before, the two great antagonistic processes in the intestine are the breaking down of carbohydrate material with acids end products, and the breaking down of proteid material with alkaline end products. Normally, in the artificially fed infant, these two processes just about balance each other, and if one greatly preponderates, trouble usually results. When excessive fermentation of carbohydrate takes place, the place of the greatest acidity is probably in the large intestine, although the small intestine is involved to a lesser extent. The acids are formed mostly in the intestine, and to a very slight extent in the stomach, as the hydrochloric acid of the stomach contents has a very powerful anti-bacterial action, and the small amount of volatile fatty acid formed there is due to enzyme and not to bacterial activity.

The acids formed may be of two sorts:

1. The non-volatile acids, represented chiefly by lactic and succinic acids, neither of which is particularly harmful.

2. The volatile fatty acids, represented by the acid series which starts with formic acid, CH_2O_2 and runs up to cerotic, $\text{C}^{26}\text{H}^{52}\text{O}_2$. The acids which are contained in fats (palmitic, stearic, and oleic) are of this series. There are 19 acids in the series, but it is unlikely that the higher members of the series are formed in the intestine. The most important ones are formic, acetic, propionic, butyric, valeric, capronic, caprylic, and caprinic.

Probably most of the acids arise from the carbohydrate, but some of the higher ones undoubtedly come from the fat. It is hard to say to just what extent these higher acids, arising from the fat, may be broken down to the lower ones, but probably to no great extent, and for all practical purposes it is safe to say that nearly all the harmful acids come from the carbohydrate. The most harmful of these acids is probably acetic. Small amounts of acetone and formaldehyde are also probably formed, both of which substances, if present in any considerable amount, are tremendously irritating to the intestine. The sugar molecule contains so many

carbon atoms that a very great number of substances may be formed from it. It is probable that almost always all the sugar in the intestine is either absorbed or split up into acids, for it is rare to find sugar in the stools of babies, no matter on how high a sugar percentage they are being fed.

The first action of the volatile fatty acids is to irritate the intestine, and to cause an increased secretion of mucus and an increased peristalsis, with frequent loose stools. Given a diarrhea with increased peristalsis and frequent watery movements, the absorption of all the food elements is lessened on account of the increased peristalsis and larger amount of fecal material lost. In a three-day metabolism period on a six-months old baby who had 12 watery green acid movements during the period, Talbot and Hill² found that the weight of the dried stool was nearly twice as much as under ordinary conditions. The neutral fat in the stool rose from 1.14 to 6.00 gm., the soaps and fatty acids from 5.78 to 8.46 gm., the ash from 5.3 to 7.17 gm., and the nitrogen from 1.11 to 2.01 gm. The percentage absorbed dropped as follows: Fat, 90 to 74%; nitrogen, 90 to 79%; ash, 68 to 43%.

Jundell,³ also gives figures very close to these, and found that in addition to a poor absorption of fat, there was also a greatly diminished power to split fat. There are also other factors than increased peristalsis which cause lessened absorption. These apply particularly to the fats and to the salts.

In the normal digestion of fat, the prevailing view is at the present that the neutral fat is split by the pancreatic lipase (steapsin) into glycerol and fatty acids. Part of these acids are dissolved in the bile and absorbed as fatty acids. The rest unite with the alkali of the pancreatic juice to form soluble soaps. These, with the acid of the bile in forming an emulsion, are absorbed.

In an excessively acid condition of the intestine this procedure may be interfered with in several ways. In the first place, bile is a *notoriously unstable substance, especially in an acid medium, and it is very probable that it is decomposed by the acids present and thus rendered useless in the emulsification of the fat.* Also, *it is a fact that no emulsion of fat or soap can exist in a strongly acid medium, so with these two factors at work it is hard to see how the absorption of fat can proceed.* One sees a good many infants who have not a true diarrhea, but four or five rather spongy, acid stools every day, with a good deal of soap in the stool—and when the carbohydrate intake is cut down the fat absorption becomes better. It is likely that the poor absorption of fat in these cases is due to the two factors discussed above: decomposition of the bile, and poor emulsification, due to a too strongly acid intestinal contents.

The relation of the fats to the alkaline earths, calcium and magnesium, and to the alkalis, so-

dium and potassium, is an interesting one. It is possible for four different kinds of soaps to be formed in the intestine: those of calcium and magnesium, and those of sodium and potassium. The two former are insoluble, and difficult of absorption, and the two latter soluble, and easy of absorption. It is conceivable that in the neutralization of the lower volatile fatty acids formed, all the sodium and potassium, which are the strongest bases, is used up, thus leaving the calcium and magnesium present to combine with the higher fatty acids to form insoluble soaps which cannot be absorbed. It is not certain what all the causes are which operate to induce the formation of an excess of calcium and magnesium soaps, but it is true that the more of these soaps that are formed, the less fat is absorbed. Following this reasoning, *it would seem that it is a mistake to have any lime water in the milk when there is fat intolerance.*

An important thing in fermental diarrhea is the loss of alkali. This may be caused by a combination of different factors. There is a loss of calcium and magnesium in the production of an excessive amount of soaps, there is a loss due simply to increased peristalsis, and there is a loss due to the excessive acid condition of the intestine, which stimulates the pancreas and the secreting glandules of the intestine, causing a great outpouring of alkaline secretion, which tries to do its part in neutralizing the acids present. Talbot and Hill⁴ found that in a six-months old baby on a normal diet there was an alkali retention of from 1 to 2 gm. a day, but when this same baby developed fermental diarrhea, due to the feeding of an excessive sugar percentage, there was a negative alkali balance, with a loss of about .20 gm. a day. Any long continued loss of salts does a great deal of harm to the growing organism, but it is probable that the temporary loss during an attack of fermental diarrhea is rapidly compensated for by an increased retention after the diarrhea has stopped.

TREATMENT.

It is obvious that the one important principle in the treatment of a case of fermentative diarrhea due to carbohydrate, is to give a food low in carbohydrate until normal conditions are restored. If at the same time this food can contain a considerable amount of protein, in a form which is easily digestible, a great deal will have been gained, for in this way the reaction of the intestinal contents can be changed from acid to alkaline, by the alkaline end products of protein disintegration, and the source of the diarrhea removed. It is the high protein and relatively low carbohydrate percentage that has made the "eiweiss" milk of Finkelstein, and its various modifications valuable. The great drawback to these is their difficulty of preparation. The use of skim milk dilutions, with the addition of powdered casein, meets the indication in treating fermental diarrhea, and such mixtures are in-

finitely more simple of preparation than any of the "eiweiss" milk preparations. During the past summer I have treated my cases of fermental diarrhea in this way. A soluble form of "calcium casein" was used, and found very satisfactory, the mixtures being very easy of preparation and the babies taking it very well. For babies under six months old a mixture of skim milk and water is used, with enough "calcium casein" added to bring the protein percentage up to 2.60%—giving a formula: Fat, .25; sugar, 2.25; protein, 2.60. For babies over six months old the same dilution of casein is added to 3.00%. One-third of an ounce of powdered casein in a mixture of 16 oz. of skim milk and water is used, but the powdered milk and 16 oz. of water, raises the protein percentage to 2.60%. In a 48 oz. mixture (24 oz. skim milk and 24 oz. water) 2/3 oz. of powdered casein raises the protein to 3.00%. The amount given at each feeding depends of course on the individual baby, but in general, slightly smaller amounts are given than would be given to a well baby of the same age and weight. The usual course of a case is that after a day or two of casein milk feeding the stools begin to diminish in number, become more yellow and after three to five days become pasty, light yellowish brown in color, and alkaline in reaction. After the diarrhea has stopped, whole milk is added to make the fat percentage from 1 to 2%, and if this is borne well, in 2 or 3 days enough sugar is added to make the sugar percentage about 3.50%. Malt sugar is the best sugar to use, as it ferments less easily than do the other sugars. Sometimes the powdered casein is continued, sometimes not, depending on the case, but I have not fed any case on it for longer than 10 days. If the addition of the malt sugar causes no diarrhea, a gradual addition of sugar, and a return to the normal feeding is made. No drugs should be given to these cases. Drugs do the condition no good: it is simply a question of reestablishing the acid-alkali balance of the intestine. I do not believe in an initial purge with castor oil: The irritating acids that have formed are quite enough of a cathartic and it is adding insult to injury to irritate the intestine further. If there is a great deal of tenesmus and discomfort at defecation, and a great many stools, it is wise to give small doses of opium, but other than this no drugs are needed. It would be tedious to give a number of case reports in detail, as most of the cases are very much the same, but a brief summary may be of interest. Thirty-five cases of fermental diarrhea were treated in the manner above described: all but two did well—one of these could not keep the high protein milk on his stomach, the other kept it down, but it did him no good. The remaining cases were most satisfactory. Most of the cases were babies under a year old, and it is surprising how they held their weight while being treated for diarrhea with the high protein milk: indeed a good many actually

gained. The average time of casein milk feeding was about five days: most cases began to improve in 48 hours.

On the whole I am convinced that when a high protein and a low carbohydrate milk is indicated, the best and simplest way of giving it is with skim milk and water dilution, made up to the required protein percentage by the addition of soluble "calcium casein."

CASE REPORTS.

CASE 1. July 27, 1915, female, 15 mos., weight 19 lbs. 5 oz.; 3 loose, brownish, sour stools yesterday.

Treatment: skim milk, 24 oz., water, 24 oz., F. 25%, C. 2.25%, P. 3.00%; casein 2/3 oz., 6 F. of 8 oz. July, 31, weight 19 lbs. 12 oz. (gain 7 oz.) Stools are normal, and rather hard and yellow, Bowels move once a day.

Treatment: Whole milk with half the cream removed, zwiebach, farina, oat jelly, soup. A very mild case, which did not need to be kept on the casein milk diet very long, and which was easily returned to normal diet without any recurrence of diarrhea.

CASE 2. July 26, 1915, 1915, male 2 mos., weight 9 lbs. 4 oz.; 3 or 4 bright green, loose, very sour stools a day. Is taking F. 2.50%, C. 6.00%, P. 1.00%, 4 oz. every 2½ hours.

Treatment: Continue the same formula and give the same quantity at each feeding, but add 1/3 oz. of casein to the day's feeding, making the protein 2.50%. Aug. 2, weight 9 lbs. 15 oz. (gain 11 oz.) After a day's feeding on the high protein milk the stools changed from green to yellow, and he had only two a day. Two days ago all the casein was used up, and today his stool was green, loose and sour again.

Treatment: Continue the same as before, with casein milk. Aug. 16, used the high casein milk for two days, diarrhea promptly cleared up, and is now having two normal stools a day. A case illustrating the importance of the relation between the carbohydrate and the protein, for no change was made in the feeding in this case except to increase the protein from 1.00% to 2.50%.

CASE 3. July 31, 1915, male, 7 mos., weight 11 lbs. 11 oz.; 5 loose, spongy, sour smelling stools yesterday, with many small fat curds. Is taking: F. 2.50%, C. 4.00% lactose, P. 1.80%, starch, .75, 7 F. 6 oz. 2.00% maltose

Treatment: F. 1.50%, C. 2.00% lactose, P. 2.80% 1.00% maltose,

(powdered casein) 7 F. 6 oz. Aug. 3, weight 11 lbs. 6 oz. (loss 5 oz.) 5 stools yesterday, yellowish and full of small soft curds, exactly the same as at the last visit. No improvement.

Treatment: Continue the same. Aug. 9, 4 stools yesterday; brown in color, rather loose. Neutral reaction.

Treatment: Continue the same. Aug. 16, fed the casein milk for two days, and stools became normal. Is now having two normal yellow stools a day; weight 11 lbs. 12 oz. (gain 1 oz.)

CASE 4. Female, 11 mos., weight 21 lbs. 10 oz. Bowels have been loose for a week. For the last

2 or 3 days has been having 15 to 20 green, curdy stools a day.

Treatment: skim milk, 32 oz., water, 8 oz., F. 25%, C. 3.00%, P. 2.90%; lime water, 8 oz., 6 F. 8 oz., casein 1/3 oz. Aug. 6, vomited the casein milk, so mother stopped it after a day and a half. Weight 21 lbs. 11 oz. (gain 1 oz.)

Treatment: skim milk, 24 oz., barley water, 24 oz., 6 F. 8 oz. Sept. 4, mother says that the diarrhea stopped in a few days after this diet was begun, and that she then resumed the regular diet of the child. One of the very few cases that could not take powdered casein.

CASE 5. Aug. 11, 1915, female, 18 mos., weight 16 lbs. 8 oz.; 7 yellow stools yesterday. A little tinge of blood in one.

Treatment: skim milk, 24 oz., F. .25%, C. 2.25%, P. 2.40%; water, 24 oz., 6 F. 8 oz., casein, 1/3 oz. Aug. 16. Yesterday had 3 normal looking movements, and the day before yesterday only one.

Treatment: whole milk, 36 oz., water, 12 oz., F. 2.00%, C. 2.25%, P. 3.20%; casein, 1/3 oz., 6 F. 8 oz.

CASE 6. Aug. 9, 1915, female, 3 mos., weight 10 lbs. 10 oz. Yesterday had 18 green loose movements during the day, and three during the night. Temperature 100.

Treatment: skim milk, 16 oz., water, 16 oz., F. .25%, C. 2.25%, P. 2.60%; casein, 1/3 oz., 8 F. 4 oz. August. 12, weight 10 lbs. 15 oz. (gain 5 oz.) 5 stools yesterday, 1 yellow and 2 green.

Treatment: Continue same. Aug. 16, weight 11 lbs. 2 oz. (gain 3 oz.) 3 stools yesterday, 1 yellow and 2 green.

Treatment: whole milk, 16 oz., water, 16 oz., F. 2.00%, C. 2.25%, P. 2.60%; casein, 1/3 oz., 8 F. 4 oz. Aug. 19, weight 11 lbs. 6 oz. (gain 4 oz.) One yellow formed stool a day.

Treatment: whole milk, 18 oz., water, 18 oz., F. 2.00%, C. 5.8%, P. 1.60%; dextri-maltose, 3 tbsp., 8 F. 4 1/2 oz.

CASE 7. Female, 1 year, weight 11 lbs. 14 oz. Convalescent from pneumonia. Has had 9 or 10 loose, green, slimy movements for the last 2 or 3 days. Is taking: F. 1.6%, C. 6.00%, P. 1.30%, 6 F. 8 oz.

Treatment: skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 2.40%; casein, 1/3 oz., 6 F. 8 oz. August 16. The day after she began taking the high protein milk the diarrhea stopped, and the color changed from green to yellow. Had 4 stools yesterday and only 1 today; weight 12 lbs. 5 oz. (gain 1 lb. 7 oz.)

Treatment: whole milk, 27 oz., water, 21 oz., F. 2.25%, C. 2.70%, P. 2.60%; casein, 1/3 oz., 6 F. 8 oz.

CASE 8. Aug. 16, male, 1 year, weight 20 lbs. 8 oz. For the last 3 or 4 days has had 4 or 5 loose, green movements a day.

Treatment: skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 2.40%; casein, 1/3 oz., 6 F. 8 oz. August 19, weight 20 lbs. 9 oz. (gain 1 oz.) 4 stools yesterday. Stool is rather light green, no mucus, no curds. Not a bad looking stool, but still not normal.

Treatment: whole milk, 18 oz., water, 30 oz., F. 1.50%, C. 1.75%, P. 2.60%; casein, 2/3 oz. 6 F.

8 oz. Aug. 23, 3 stools yesterday; greenish, but not loose; weight 20 lbs. 7 oz. (loss 3 oz.)

Treatment: same. Aug. 26., Diarrhea has stopped. Is constipated now. One normal movement a day.

Treatment: whole milk, 24 oz., barley water, 24 oz. for one day, then whole milk, 40 oz., barley water, 8 oz. with crackers, farina and zwieback.

CASE 9. Aug. 14, female, 14 mos., weight 20 lbs. Has had 7 or 8 green movements for the last 3 or 4 days.

Treatment: skim milk, 4 oz., water, 4 oz., F. .25%, C. 2.25%, P. 2.40%; casein, 3i every three hours.

Aug. 17. Diarrhea stopped after she had had several bottles of the high protein milk. Stools are normal.

Treatment: skim milk, barley and oat jelly, dry bread.

CASE 10. Aug. 25, male, 13 mos., weight 17 lbs. 12 oz. Diarrhea for a week, 10-12 stools a day; loose, bright green, and full of curds and mucus. Is taking F. 3.00%, C. 6.00%, P. 2.00%, with bread and crackers.

Treatment: skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 3.00%; casein, 2/3 oz., 6 F. 8 oz. Aug. 30. Eight or nine stools yesterday, but they were small and not very loose. No green stools for two days. The stool brought in is yellow, pasty, alkaline—a normal looking stool. Had only one stool today; weight 18 lbs. 4 oz. (gain 8 oz.)

Treatment: whole milk, 24 oz., water 24 oz., F. 2.00%, C. 3.00%, P. 3.00%; dextri-maltose, 1 tbsp., casein, 2/3 oz., 6 F. 8 oz. September 3, weight 20 lbs. (gain 1 lb. 12 oz.) Doing very well. Has 3 or 4 light colored, pasty stools a day.

Treatment: whole milk, 32 oz., barley water, 16 oz., 6 F. 8 oz., with farina, oat jelly, and crackers. A very satisfactory case, especially as far as gain in weight was concerned.

CASE 11. Aug. 24, female, 5 mos., weight 10 lbs. 12 oz. Has been having 5 or 6 loose green movements a day, with many curds. Mother made a mistake in mixing her modification, and has been using 6 tbsp. of milk sugar to the day's feeding instead of 3, thus giving the baby over 8.00% of sugar.

Treatment: skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 3.00%; casein 2/3 oz., 6 oz. 7 F. Aug. 28, four stools yesterday and 4 the day before. Stool brought in is large, not loose, pasty, grayish green in color; weight 10 lbs. 14 oz. (gain 2 oz.)

Treatment: whole milk, 24 oz., water 24 oz., F. 2.00%, C. 4.6%, P. 1.60%; lactose, 3 tbsp., 6 oz., 7 F. Sept. 1. Stools are normal, yellow, only 2 or 3 a day.

Treatment: whole milk, 24 oz., water, 24 oz., F. 2.00%, C. 4.6%, P. 1.60%; lactose, 3 tabsp., 6 oz., 7 F.

CASE 12. Sept. 2, male, 6 mos., weight 15 lbs. 8 oz. Has had 5 or 6 green slimy movements a day, for the last few days. Is taking: F. 3.00%, C. 5.50%, P. 1.50%, 7 F. 7 oz.

Treatment: skim milk, 24 oz., water, 24 oz. F. .25%. C. 2.25%, P. 3.00%; casein, 2/3 oz. 7 F. 7 oz. Sept. 7, weight 15 lbs. 10 oz. (gain 2 oz.) After a day and a half of feeding the high protein milk.

the loose movements stopped, and the baby is now having one normal yellow stool a day.

Treatment: whole milk, 30 oz., barley water, 10 oz., F. 2.6%, C. 5.50%, P. 2.3%; lime water, 8 oz., starch, .40%, 7 F. 7 oz., lactose, 3 tbsp.

CASE 13. Sept. 3, male, 7 mos., weight 14 lbs. 5 oz. Yesterday had 5 or 6 loose green stools. Is taking F. 2.00%, C. 5.50%, P. 1.60%, 7 F. 5½ oz. *Treatment:* skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 3.00%; casein, 2/3 oz., 7 F. 6 oz. September 7, weight 14 lbs. 4 oz. (loss 1 oz.) After about 48 hours of the casein milk feeding the stools became normal, and he is now having 2-3 yellow stools a day. The stool brought in is yellow brown, salve like, alkaline in reaction—a typical high protein stool.

Treatment: whole milk, 12 oz., skim milk, 12 oz., F. 1.00%, C. 2.25%, P. 3.00%; water 24 oz., 6 F. 8 oz., casein 2/3 oz.

CASE 14. Aug. 30, female, 3 mos., weight 11 lbs. 14 oz. Had 4 green stools day before yesterday, and 3 yesterday. The stool brought in is green, loose, and has a strongly acid reaction.

Treatment: skim milk, 16 oz., F. .25%, C. 2.25%, P. 2.40%; water, 16 oz., 8 F. 4 oz., casein, 1/3 oz. Sept. 4, weight 12 lbs. 7 oz. (gain 9 oz.) Doing very well, has 2 or 3 good stools a day. The stool brought in is yellowish brown, pasty and has a strong alkaline reaction. Baby in splendid condition.

Treatment: whole milk, 8 oz., skim milk, 8 oz., F. 1.00%, C. 3.45%, P. 2.40%; water, 16 oz., 8 F. 4 oz., lactose, 1 tbsp., casein, 1/3 oz. Sept. 10, weight 12 lbs. 13 oz. (gain 6 oz.) Has 2 or 3 yellow pasty stools every day.

Treatment: whole milk, 18 oz., F. 2.00%, C. 3.25%, P. 1.60%; water, 18 oz., 8 F. 4½ oz., dextri-maltose, 1 tbsp.

CASE 15. Aug. 24, female, 11 mos., weight 16 lbs. 8 oz. Had had diarrhea for the last two weeks; 6 or 7 loose green movements a day. The case was seen by the family physician two days before entrance and was put on 6% lactose solution, with 1.5% barley starch. The movements did not improve and the stool brought in was small and green with a large amount of mucus.

Treatment: skim milk, 24 oz., water, 24 oz., F. .25%, C. 2.25%, P. 3.00%; casein, 2/3 oz., 6 F. 8 oz. Aug. 28, three stools yesterday, yellow and normal. The stools began to get better after about two days on the high protein milk. The stool brought in is bright yellow, rather hard, normal. *Treatment:* whole milk, 24 oz. F. 2.00%, C. 3.00%, P. 1.60%; water 24 oz., 6 F. 8 oz., dextri-maltose, 1 tbsp.

NOTE.—In the above list of cases, not all the cases treated are reported, as many of them are practically identical.

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- ² Talbot, F. B., and Hill, L. W.: The Influence of Lactose on the Metabolism of an Infant. American Jour. Diseases of Children, Vol. 8, p. 218, September, 1914.
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THE ALCOHOLIC AS SEEN IN COURT.

BY VICTOR V. ANDERSON, M.D., MUNICIPAL COURT, BOSTON.

THIS study was originally undertaken with the aim in view of getting at the problem presented to the court by the chronic alcoholics; the so-called "old rounders," who are repeatedly arrested for drunkenness and seem more or less unmodified by any form of treatment; who serve many terms in the House of Correction, in jail, or at State Farm, but invariably find their way back into court when turned out into society. This report is based upon investigation of one hundred such cases, chosen at random from habitual and periodic drinkers (fifty of each), who have been repeatedly arrested for drunkenness.

It is assumed that these one hundred cases fairly well represent the class of alcoholics just referred to, and are average cases; many more serious cases, individuals arrested fifty, one hundred and more times, were known not to be included in this group. The occasional drinker, the mild social drinker, and such, who appear in large numbers in court and profit by the lessons learned from arrest and detention, or judicial reprimand, or probation, or short term sentences, do not form difficult problems, and may for the practical purposes of this paper be wholly disregarded.

The following table shows that each individual averaged a little more than seventeen arrests apiece; though some were known to have old records that were not obtainable:

STATISTICS OF ARRESTS.

Number of Cases.	Number of Times Each Individual Was Arrested.	Total Number of Arrests of Group.
50 steady drinkers.....	21	1050
50 periodic drinkers.....	14.5	725
100 alcoholics.....	17.75	1775

The frequency of arrests serves to call attention to the seriousness of the situation from the standpoint of the court. These 100 alcoholics totaled 1775 arrests. It is obvious that the usual methods of punishment had failed to modify their alcoholic tendencies, for after short terms of imprisonment and then freedom, they appear again in court to go through the same procedure over and over; off to prison, out in society, back into court, and so the process is repeated as the years go by. Eventually they become a burden to the court and needlessly clog its machinery.

If we now turn to another aspect of the problem, their ability to support themselves out in society, we find the following facts:

STATISTICS OF ECONOMIC EFFICIENCY.

	Percent.
Steadily employed.....	10
Irregularly employed.....	40
Odd jobs.....	18
Do not work at all.....	13
Housework at home (women).....	19

Only 10% were steadily employed. Practically one-half of these 100 cases were not self-supporting.

	Percent.
Self-supporting	51
Not self-supporting.....	49
	100

Almost universally now are earnest students of the situation attributing society's failure in properly handling the alcoholics to the fact that their physical and mental conditions have been disregarded. The nervous system of everyone of these 100 hundred cases showed some impairment, whether it be of sensory capacity, vision, hearing, touch, etc., or disturbed reflexes, or poor motor co-ordination, or muscular tremors, or what; while the mental inferiority was evident in more than three-fourths of the cases, as the following table will show:

TABLE OF MENTAL LEVEL AS SHOWN BY MENTAL TESTS.

Mental Level.	Number of Cases.
Eight to nine years.....	15
Nine to ten years.....	21
Ten to twelve years.....	20
Sub-normal	21
Adult	23
	100

77% showed an inferior substandard mentality, while 56% had a mental level below the limit of 12 years.

Finally, the following table of diagnoses will explain the most important causative factor underlying the frequency of arrest, the economic inefficiency, and the low level of mentality of these 100 cases:

TABLE OF DIAGNOSES.

Feeble-mindedness	37
Insanity	7
Epilepsy	7
Alcoholic deterioration	17
Psychopathic constitution	32
	100

These are all essentially medical problems, and might more profitably be handled as such.

CONCLUSIONS.

We find that the chronic alcoholics spend a good proportion of their time in and out of institutions. When out in society, in not more than half of the cases are they able to support themselves. They suffer from physical and mental

handicaps, that are in general considered as serious medical problems. They are in need of such care and treatment as are given to those suffering from physical and mental diseases or defects, rather than the ordinary penal treatment in the past afforded them.

The alcoholic himself would be better off, for he would be handled in the light of what he is and what he needs, rather than what he has done; the best interests of social welfare would be better served, in that society would be more securely protected from those that are a menace and a burden; and, finally, there would be an economic saving, in that the cost for maintaining these individuals in penal institutions, handling them over and over in the courts, and supporting them out in society, would go towards building them up physically and mentally and so equipping and training them that they may eventually become selfsupporting.

Such a plan would not be revolutionary and would have no reference to the handling of drunkenness in general, but would simply provide ample farm-colony and hospital facilities for those chronic alcoholics whom the courts may consider in need of prolonged confinement and treatment.

A further analysis of these 100 cases discloses two distinct types, important to recognize, essentially different in makeup, and apparently requiring different methods of handling:

- The Steady Drinker.
- The Periodic Drinker.

The steady drinker has been in the habit of imbibing alcohol more or less steadily, and perhaps in small quantities, for a prolonged period of years. He shows an insidious, progressive impairment of his nervous system and lowering of the functional activities of the entire organism.

"The periodic drinker has drunk paroxysms which subside and are followed by periods of sanity and rational thought and conduct. Then suddenly the storm breaks out again, and he drinks to great stupor; from this he recovers only to have another paroxysm." In the intervals between "sprees" he may not touch alcohol at all, and remains for months without it. He is a neurotic individual with a nervous system that is unstable and poorly balanced; which instability is the prime factor underlying his drinking habits and his impulsive conduct in general.

The following table illustrates very clearly the difference in the makeup of these two types of alcoholics:

MENTAL LEVEL OF ONE HUNDRED ALCOHOLICS.

Level of intelligence.....	8-9 yrs.	9-10 yrs.	10-12 yrs.	Sub-normal	Adult
50 steady drinkers.....	15 (30%)	19 (38%)	9 (18%)	5 (10%)	2 (4%)
50 periodic drinkers.....	—	2 (4%)	11 (22%)	16 (32%)	21 (42%)
Totals	15	21	20	21	23
					100

Comparing the two types from the standpoint of intelligence, we find from above table that only 14% of the steady drinkers have a mental level above 12 years, while 74% of the periodic drinkers are above this level; that 86% of the steady drinkers have a mental level below 12 years, while only 26% of the periodic drinkers possess so low a grade of intelligence. The steady drinkers in general show a low level of intelligence; though adult in years and in physical development fully grown men and women, still they have the mental capacity of children. Is it any wonder that they fail to measure up to the standards set for them? Possessing as they do a defective or deteriorating mentality, they are unable to compete on equal terms out in society with those more favored in intelligence, and are in a large proportion of cases unable to support themselves.

The periodic drinkers possess a higher grade of intelligence and are far more capable individuals; but, as will be seen later, have certain character anomalies, certain personality maladjustments, that are responsible for their alcoholic outbreaks.

If we now turn to the table of diagnoses it will at once be evident why the difference in these two types is more fundamental than is implied merely in the terms "steady" and "periodic" drinkers.

From this table it will be seen that 72% of the steady drinkers are not self-supporting, while 74% of the periodic drinkers are self-supporting. If we now recall that 74% of the periodic drinkers possessed a mentality above the 12-year limit and 86% of the steady drinkers possessed a mental level below the 12-year limit, the connection between the two will be evident.

It is possibly safe to conclude that in general the chronic alcoholic who has been drinking steadily over a period of years is either a mental defective to begin with, or, from the continued abuse of alcohol, suffers such an insidious impairment of his nervous system and degeneration of his higher mental facilities as to be unable to properly support himself out in society, and is in need of proper institutional care and medical attention. Merely locking them up for short periods, and then turning them out again, would, in the light of the above facts, hardly seem to meet the needs of the situation. Prolonged hospital care and farm-colony treatment are indicated.

With the periodic drinker, on the whole, a different problem is presented. The proportion that are insane, or feeble-minded, or suffering from alcoholic deterioration, is small. In general the periodic drinker is a neurotic individual, possessing the mental characteristics of the psychopath. He is impulsive, unstable, lacking in

TABLE OF DIAGNOSIS OF ONE HUNDRED ALCOHOLICS.

Classification.	Mental Defective.	Psychopath.	Epileptic.	Insane.	Alcoholic Deterioration.	Totals.
50 steady drinkers.....	29 (58%)	—	4 (8%)	5 (10%)	12 (24%)	50 (100%)
50 periodic drinkers.....	8 (16%)	32 (64%)	3 (6%)	2 (4%)	5 (10%)	50 (100%)
Totals	37	32	7	7	17	100

The feeble-minded predominate among the steady drinkers, while the psychopaths predominate among the periodic drinkers. Only 24% of the steady drinkers could attribute their condition purely to alcohol. Only 10% of the periodic drinkers showed no other important causative factor. In 66% of cases did the steady drinker start his career with a mental and nervous handicap (feeble-mindedness and epilepsy). In 86% of cases did the periodic drinker start his career with a mental and nervous handicap (feeble-mindedness, psychopathic constitution, epilepsy).

Finally, the following table of economic efficiency will be seen to correlate well with the foregoing mental findings in these two types of alcoholics:

inhibitions, and highly emotional; often possessing good intelligence, and being quite capable, but apparently unable to make proper use of whatever mental faculties he has, because of his remarkable instability. He works for short periods fairly well, but tries all sorts of occupations, and succeeds in none, because of his lack of continuity of purpose and capacity for the continuous expenditure of effort in any one direction. Out of a clear sky comes an outbreak of alcoholism; in this he appears so irresponsible as to be often thought insane. He drinks for days, or even weeks, and sometimes to great stupor, and then, just as suddenly as it started,

ECONOMIC EFFICIENCY.

Working Capacity.	Steadily Employed.	Irregularly Employed.	Odd Jobs.	Housework at Home.	No Work at All.	Totals.
50 steady drinkers.....	1 (2%)	13 (26%)	16 (32%)	7 (14%)	13 (26%)	50 (100%)
50 periodic drinkers.....	9 (18%)	27 (54%)	2 (4%)	12 (24%)	—	50 (100%)
100 alcoholics.....	10 (10%)	40 (40%)	18 (18%)	19 (19%)	13 (13%)	100 (100%)

the attack is over, his mental condition clears up, and he may not touch alcohol for months. His difficulty lies in his character makeup and temperamental peculiarities. He cannot take things as they are in life; cannot see things in their proper light; is over-sensitive; broods over imaginary wrongs; is unable to shoulder responsibilities, and desires to place a veil between himself and reality. In short, he is constitutionally unequipped to fight the battles of life, and when things become too strenuous for him, he seeks forgetfulness in alcohol.

These individuals are little modified by any form of treatment that does not take into account their mental makeup, or does not tend to build up in them new habits of thought and action. Rather than needing prolonged confinement in hospitals and farm colonies, these individuals have to be incorporated back into society by means of well-directed medical and social service methods of treatment.

SUMMARY.

In a study of 100 alcoholics, who were found to have been repeatedly arrested for drunkenness, and who represented fairly well the typical "old rounders," so-called, who have spent much of their time in and out of penal institutions, and whose conduct seemed little modified by such treatment, it was found:

1. That not more than one-half were capable of supporting themselves out in society;
2. That 56% had the mental level of children below the age of 12 years; and
3. That they were all suffering from conditions in general regarded as medical problems.

For purposes of treatment they, in general, fall into two classes (this must be taken in the very broadest sense);

(a) The *Steady Drinker*, whose mentality is either defective to begin with, or is so deteriorated from the insidious effects of alcohol as to require that he be confined for prolonged hospital care and treatment; and

(b) The *Periodic Drinker*, who, though in many instances he may require short periods of detention, as well as hospital treatment, is in general to be handled on probation and incorporated into society's scheme of living by means of well-directed medical, psychological and social service methods of treatment,—methods that take full account of his peculiar mental makeup, his character defects and temperamental difficulties.

INDUSTRIAL MEDICAL SUPERVISION.

By ARTHUR B. EMMONS, 2d, M.D., BOSTON.

Director for Appointments for Medical Alumni, Harvard Medical School.

INTRODUCTION.

THIS combined article was solicited as an example of successful Industrial Medical Supervision, by Dr. A. B. Emmons 2d, Director of Appointments for the Medical Alumni of the Harvard Medical School. He believes that many more employers of labor could wisely and profitably use, in a similar way, the well-equipped graduates of our large hospitals. He also feels that surgically equipped doctors may see the advantage of such part-time work as a valuable experience, especially in their early years of practice.

I.

THE EMPLOYER'S STATEMENT.

Medical supervision is not a new idea in our factory, but has been in practice for a number of years. We consider it indispensable and a most satisfactory investment, benefiting both employer and employee.

We employ from seven to eleven hundred people, about two-thirds of whom are women. The majority of these are unskilled workers.

We began the work in an effort to protect our customers and ourselves against possible danger resulting from the handling of confectionery by diseased or sick persons, but much more than this has been accomplished. Examination, by physician or nurse, of new employees, and supervision of all, gives us an added opportunity to avoid unhealthy and undesirable help. The physician's factory inspection helps us to develop and maintain higher standards of sanitary conditions and better factory practice. The nurse's work among our employees is, in a way, the human touch of a corporation, which organizations are said to have no souls. The nurse, in addition to constant explanation of personal hygiene, gives occasional helpful talks to groups of employees. Foremen and forewomen are required to report to, or send to, the nurse anyone whom they may suspect of needing attention. A rag on one's finger, or an apparent inability to maintain the ordinary standard of routine would be considered good cause. Employees wishing to leave work because of sickness are referred to the nurse. Some are sent home, some given attention in the rest-room, others admit feigning illness, and are sent back to work. The work is carried on without expense to the employee or to the Relief Association, but service is almost entirely confined to the factory location and hours, without loss of time to the employee.

The work is not only remedial, but educa-

tional, for good habits are formed and proper care of one's self established, insuring a measure of health which makes for regularity in attendance of employees in physical condition favorable to good, rapid, cheerful work.

The results in dollars to our Company are difficult to measure, for most of the return comes indirectly in the form of better health, good spirits, increased interest in work, also in a better class of employees. We also gain the confidence of workmen, salesmen, and even of the consumer, in the healthfulness of our product.

The above facts, together with the happiness afforded, and the good-will fostered among our employees, and the more capable service rendered by them, fully compensate us for the expense involved in securing a physician of experience and marked ability, and a nurse possessing the personal requirements for handling and steadily influencing so large a number.

Our dispensary and rest-room, though perhaps the quietest departments of our factory, exert an influence on the whole, which we should now find it difficult to do without, and we feel that in working for the safety of the public we are benefiting our employees and ourselves.

II.

THE VALUE TO EMPLOYERS AND EMPLOYEES OF TRAINED MEDICAL SUPERVISION IN INDUSTRIAL PLANTS.

BY WILLIAM STEWART WHITEMORE, M.D.,
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Assistant Visiting Surgeon to the Cambridge Hospital.

After an experience of over five years as surgeon to a large confectionery factory, I am so impressed with the value to employers and employees of trained medical supervision that I wish to urge the establishment of such supervision in all industrial plants employing any considerable number of persons.

The company which I serve employs over eight hundred factory hands, in addition to an ample office force. Although the plan which I am about to describe is particularly applicable to establishments which manufacture food products, such as candy, bread, and biscuits, it may readily be adapted to the needs of any industry.

The problems confronting me when I undertook this work were:

1. To make sure that every employee, who came in contact with the candy or any of its ingredients, was free from communicable disease.
2. To make sure that every new employee that entered the factory should be similarly free from communicable disease.
3. To keep the employees in good health.

In order to find out whether the eight hundred odd factory workers were in good health, I had to go through the factory, systematically examining each employee. The method pur-

sued was as follows: From the superintendent's office I secured cards bearing the name, number, and department, or room number of each employee. Below there was space where I could record whether I found the person in good health or not. (See Fig. 1.). Each card was

FIG. 1.

Dept.	Name.	Number.
26	John Doe.	75
Remarks.		

Examination satisfactory.

filled out by me after my examination and put on file in my office card catalog. I examined all the employees in one department before going on to the next. When I visited a department I gave these cards to the foreman in charge, who then distributed them to the employees, each receiving the card with his or her name upon it. The workers then formed in line and filed out to be inspected. I took a position in an adjoining ante-room or hall, where the light was good, and went over each employee carefully. If any of the factory hands were absent, the foreman retained their cards, and they were sent to my office for examination the moment they returned to work.

Whenever I found a curable disease, the employee was temporarily excluded from work, but came to my office in the factory for treatment. When well, he returned to his work. Anyone suffering from an incurable malady was discharged, but was placed under the care of the proper hospital for the treatment of his disease.

In order that no new employee should enter the factory with a communicable disease, the ruling went forth that every person who was engaged to work must present to his foreman a certificate from me saying that I had examined him, and had found him in good bodily health. Repeatedly I have excluded from the factory persons suffering from contagious skin diseases which had escaped the eye of the superintendent who had engaged them.

The remaining problem was to keep the employees in good health. The first move in this direction was to gain the confidence of the men and women employed in the factory, and to encourage them to come to me to report whenever they were ill. The company fitted up a very good dispensary, centrally located in one of the factory buildings and easily accessible to the employees. I began by having office hours for an hour and a half twice a week, but the service became so popular that now I have office hours three times a week. Next, a graduate nurse was engaged, who is on duty in the dispensary all the time. She dresses all kinds of minor injuries and sends the more serious ones to the hospitals of Boston, in case I am not present to care for them myself. The company supplies the employees with medicines free of charge. I have on hand a good stock of tablets, ointments, etc., and very rarely have to give a prescription to a patient.

All the foremen and forewomen have been instructed to report to me any worker who has anything the matter with him, whether it be a blister or a cough, a rash or a headache. Minor injuries, such as scratches or burns, which formerly went untreated and were frequent sources of blood-poisoning, are now reported at once, and are treated so carefully that in five years I have been able to reduce the number of cases of blood-poisoning to a negligible minimum. However, I do not entrust the health of the employees to the vigilance of the foremen and forewomen entirely, but I make it part of my regular work to inspect each department, to see for myself how everyone is faring. On such occasions I frequently "spot" some slight injury or skin trouble, which has been overlooked or regarded as too trivial to report.

I must not fail to mention certain general rules which are of importance. Whenever a hand is absent from work he must receive upon his return a certificate from me saying that he is in good health, before he is allowed to resume his occupation. Each employee must be successfully vaccinated before he can enter the employ of the company. I well remember how, within the past three years, an entire factory in another industry in a neighboring city was obliged to suspend work because of an outbreak of smallpox among the workers. This is a disease which can be absolutely prevented by the simple procedure of vaccination, and *in no other way*.

Any person who is found to be suffering from venereal disease is discharged absolutely and is never re-employed. This is done as much for the protection of the other employees as for the prevention of the remote possibility of transmitting the disease to the consumer through the candy.

All employees addicted to the habitual use of alcohol in excess are discharged. To keep such persons near high-power machinery is to court disaster, not only to them but to other workers.

All employees afflicted with any disease, general or local, which might be transmitted to others, are excluded from handling candy until they are well. All cases of tuberculosis of the lungs are discharged at once and are never re-employed. Such persons should not, for their own sakes, be shut up in a factory, but should have employment out of doors.

Careful records are kept of all patients treated in the dispensary. Employees are encouraged to confide in the factory surgeon by the fact that all the records are guarded just as secretly by the physician as are the records of his private patients. The records are kept under lock and key, and no one except the physician and nurse has access to them. The president regards them as the physician's private property, and has repeatedly stated that he does not wish to know, or have anyone except the physician and nurse know, what these records contain.

A few words now as to the type of man to select for a factory surgeon. He should be a graduate of a first-class medical school, which requires at least two years of college work before the study of medicine is permitted. He should have had at least one year's internship in a large hospital, where there is plenty of experience to be gained in treating accident cases. That he should be a *surgeon* goes without saying, because most of the accidents in a factory will require good surgical judgment in their treatment.

With a trained nurse in attendance at the dispensary all the time I find that I need to spend only one and one-half hours at the factory three times a week. In the case of factories where the work is especially hazardous, the surgeon might be obliged to make more frequent visits.

I need not dilate upon the immense advantage to the employer in such a scheme of medical supervision. Whereas formerly this company which I serve was hampered at times by having valuable men laid off with blood-poisoning and other preventable ills, it is now remarkably free from such troubles. When the company engages new employees it knows that they are fit to do the work, and it has the great economic advantage of knowing that the products it sells are pure, and no one need fear infection with disease from eating the candy it manufactures.

The advantages to the employees have already been enumerated for the most part. If an employee strains his back lifting heavy barrels, the physician confers with the superintendent, and arranges that he have some other form of work which does not require muscular exertion, until he is well. If a girl develops flat-foot, the physician secures for her a change of work, so that she may not be required to stand up, but may work sitting down.

Society is coming more and more to recognize that sickness, disease, and death are forms of economic waste, just as truly as are fires and floods. The twentieth century bids fair to be an era marked by great advances in methods of preventing disease, as well as in measures designed to make conflagrations and floods well-nigh impossible. The fire-extinguisher is found on every hand in all great manufacturing establishments, because experience has taught that just the right thing done at the moment the blaze begins will save thousands of dollars, and often human lives as well.

Trained medical supervision is comparable to the fire-extinguisher. It can prevent loss to the employer and employees alike from sickness and death. Money is being constantly expended to keep machinery in good condition, whether the machinery is used in making bread or in making shoes. Why not give as much attention to the men and women who tend the machines? If they are not well they are not at their highest point of efficiency, and the business suffers just as surely as if the machinery were poor.

III.

STATEMENT OF PRESIDENT OF MUTUAL BENEFIT ASSOCIATION OF EMPLOYEES.

The members of the Mutual Benefit Association of the Employees favor the present factory medical supervision, as it benefits them in many ways, saving them time and suffering, and making them more efficient in their work. The services and advice of a nurse are greatly appreciated, and her calling at the homes in time of illness seems to be welcomed by all of them.

IV.

THE NURSE'S STATEMENT.

I am located as Resident Nurse in a large candy factory, employing between eight hundred and one thousand persons, and am on duty during working hours. The office, or dispensary, provided for our medical department is equipped with every convenience for first-aid work, or any emergency that may occur. A sick room, cool and comfortable, with couches and blankets, has been added since I came, and there I take my patients who feel faint, overheated, or ill in any way, and fix them up so that they can return to their work. They rarely want to go home if I am able to stop their "aches and pains," and usually return to their work after a little while, grateful and refreshed. Where it used to be a common occurrence for many girls to go home for any minor ailment, since the sick room was installed it is a rare thing.

Every employee, wishing to go home on account of illness, reports at our office, so that I am able to help a great deal, and to send those needing immediate medical attention to a hospital or to their family physician. They come to the office with all kinds of ailments and, if surgical operations are necessary, we have them admitted to a hospital. My work includes minor dressings of all kinds, examination of new employees, when the doctor is not present, visits to the homes of sick employees, guarding against contagious and skin diseases, particularly tuberculosis, bringing to the doctor's attention cases for him to examine and treat, lectures and talks to the girls on prevention of disease, personal cleanliness, wearing uniform aprons and caps, care and treatment of eyes and teeth.

I do not make as many visits to the employees' homes as do many factory nurses, but when I do go I feel amply repaid in the results accomplished. There are a great many ways a nurse can be of help and service. Sometimes a girl comes to the office in great distress,—some member of her family is very sick, whom she wants to have sent to a hospital, or, what can she do for the sick baby? Or father and brother are out of work; cannot the nurse help them?

To cite a few cases:

CASE OF M. C. The father, 53 years old, was out of work, laid off indefinitely. The daughter, 18 years old, who helped support the family and worked here, had been sick three weeks at home. The mother, about 40 years old, in the second stage of pulmonary tuberculosis, was eight months pregnant. There was a girl of 11 years, and one 2 years old. With the assistance of the Associated Charities, we had the mother treated by the City Physician. The baby died shortly after birth, and, as soon as able, the mother was put in the tuberculosis ward of the hospital near by. The father was put back to work, the daughter was examined and treated by the doctor and returned to her work here, and the two small children were put in the Day Nursery until some better plan could be arranged.

CASE OF M. B. This woman worked for us several years. Her husband died, leaving her with three small children. She was an Italian and spoke very little English. We treated her for chronic appendicitis for several months, and urged her to be operated upon, and were finally successful in gaining her consent. While she was at the hospital, I investigated her conditions at home, and finding her most worthy for a mother's pension, I recommended it to the Overseers of the Poor, who acted upon it and granted it. She is now at home caring for her children, not over strong, but happy in her little home, and I often go out of my way when I am in the North End to call upon her.

CASE OF M. U. One morning one of our Italians came into the office, and in broken English, told me his little baby at home was very sick. The doctor attending it could not seem to help it. Wouldn't I have it sent to the hospital? It would surely die if I didn't. I had a district nurse call at the home and on the doctor attending it, with the result that the baby was sent to the hospital, where it remained for some time, and was finally sent home well.

Occasionally we find incipient cases of tuberculosis, and we do everything we can to arrange for them to go to some one of the state sanatoria. A number of cases have been entirely cured; others have remained in the mountains, doing outside work.

A nurse should strive at all times to keep the employees well, happy and content, as far as she is able. She should study them at their work, and encourage them to go to her with all their aches and pains and troubles. She should counsel and advise them to the best of her ability, and impress upon them that she is their friend, and that it is a pleasure for her to help them in any way possible. If she notices that this or that one is working with effort, that he looks ill, she should encourage him to see the doctor and get treatment. In doing this she prevents more serious illness and often loss of time.

In this way we have eliminated a great deal of sickness and physical inefficiency, and in the three years I have been here I can see a great

change. Many ailments then due to ignorance, are now avoided. The girls are learning to take care of their health. My talks to them on these matters have been remembered and results obtained.

I have received splendid coöperation and help from our Hospitals, the Associated Charities, the Dental Schools and the Social Service workers of Boston, and I feel that our medical work not only benefits and educates our employees here, but the knowledge gained is passed on to benefit and help the sick members of the family at home.

V.

SUMMARY FOR THE YEAR 1914.

Office calls during year.....	7177
Attending Dr. Whittemore's Clinics.....	724
Minor operations by Dr. Whittemore.....	18
New employees inspected by Dr. Whittemore.....	7
New employees inspected by nurse.....	244
Excluded from factory as undesirable.....	38
Excluded temporarily from handling candy.....	41
Cases under observation.....	80
Surgical dressings during year by nurse.....	3376
Treated at Massachusetts General Hospital.....	29
" " City Hospital.....	14
" " Relief Station.....	8
" " Mass. Char. Eye and Ear Infirmary.....	23
" " Boston Dispensary.....	3
" " Harvard Dental School.....	38

MEDICAL CASES.

Acne.....	19
Anemia.....	14
Arteriosclerosis.....	1
Atrophic rhinitis.....	1
Aortic regurgitation.....	1
Aortic and mitral disease.....	1
Acute dilatation of heart, fatal.....	1
Chapped hands.....	24
Conjunctivitis.....	10
Constipation.....	129
Colds and influenza.....	350
Chronic nephritis.....	1
Chickenpox.....	1
Debility.....	13
Diarrhoea.....	44
Erythema multiforme.....	3
Ear trouble.....	7
Eye trouble.....	5
Eczema.....	12
Epistaxis.....	5
Gonorrheal epididymitis.....	1
Hysteria.....	3
Herpes.....	6
Heat exhaustion.....	7
Hemorrhage from lungs, fatal.....	1
Headache.....	163
Insect bite.....	10
Indigestion, gastric.....	96
Indigestion, intestinal.....	40
Impetigo contagiosa.....	3
Impacted concealed molars.....	1
Menses.....	1
Rheumatism.—lumbago.....	58
Nausea and vomiting.....	56
Pregnancy.....	10
Phlebitis.....	3
Psoriasis.....	2
Pediculosis.....	3
Papilloma of uvula.....	1
Sunburn.....	6
Sciatica.....	1

Scabies.....	2
Syncope.....	21
Stomatitis.....	14
Shingles, Herpes Zoster.....	1
Tinea.....	2
T. B. eyes.....	1
Tuberculosis, pulmonary.....	5
Tonsillitis.....	137
Toothache.....	91
Tenosynovitis of wrist.....	5
Varicose veins.....	2
Vertigo.....	10
Wrist strain.....	34

SURGICAL CASES.

Abrasions.....	128
Contusions.....	34
Contusions and dislocations.....	1
Fractures.....	2
Incised wounds.....	121
Lacerated wounds.....	19
Punctured wounds.....	38
Sprains.....	2
Strains.....	9

Abscess.....	5
Appendicitis, acute, op.....	6
Appendicitis, chronic.....	3
Burns.....	139
Carbuncles.....	2
Furuncles.....	72
Frost bite.....	10
Flat foot.....	4
Foreign body in eye, removed.....	136
Gastric ulcer, operated.....	1
Hernia, operated.....	2
Hernia, not operated.....	1
Infected fingers.....	126
Infected toes.....	3
Infected hands.....	9
Infected heels.....	8
Otitis media.....	2
Sarcoma, op.....	1
Slivers removed.....	138
Stone in ureter, op.....	1
Sty.....	7
Submaxillary adenitis, op.....	1
Tonsillectomy.....	1

SUMMARY.

To sum up the material presented here, we have, briefly:

A food factory employing eight hundred to a thousand men and women, largely unskilled labor, retaining the services of a supervising surgeon and full-time trained nurse. This inspection and supervision accomplishes the following advantages:

1. To the employer, increased good-will, steadier, quicker and more contented employees. Greater cleanliness of shop and product. Sufficiently improved conditions to make the outlay entirely justified.

2. To the doctor and nurse, opportunity to be of distinct service to their patients, and to assure cleanliness and freedom from disease in the food manufactured,—no small service to the employees, the directors and the consuming public.

When the public is aware of these safeguards can other employers afford to be without such safety and advantages?

THE TRUTH ABOUT SMALLPOX AND VACCINATION.

BY GEORGE W. GAY, M.D., BOSTON.

PREVIOUS to the discovery of vaccination, smallpox was one of the most common, most contagious and most fatal of diseases afflicting the human race. It caused one-tenth of the deaths in ordinary times and, during the not infrequent epidemics, it was responsible for one-half of the fatalities. It destroyed, maimed or disfigured one-fourth of mankind. In some of the epidemics half of the children in the community under five years of age perished. Many lost their sight or hearing and few faces escaped traces of its ravages. In the graphic language of a celebrated English historian, "The disease was always present, filling the churchyard with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it had spared the hideous traces of its power, turning the babe into a changeling at which its mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to her lover."

No description can portray the terrors of an epidemic of smallpox in the pre-vaccination days. The people were helpless and hopeless in its presence. It spared neither high nor low, rich nor poor, strong nor weak, hygienic or the reverse, all were alike subject to its ravages. Recurring epidemics prevailed until practically all, not protected by a previous attack, had become infected. In other words, the disease, like a prairie fire, burned itself out for lack of fresh material.

Such, in brief, were the conditions up to the latter part of the eighteenth century. At this time the chance remark of a servant who consulted a young English physician, started an investigation that robbed the scourge of its terrors. "I can't have smallpox, because I've had cow-pox," said the patient above alluded to. After nearly a quarter of a century's observation and study, Dr. Edward Jenner became so firmly convinced of the truth of the milk-maid's assertion that he deliberately vaccinated James Phipps, a lad eight years of age, with virus taken from the hand of Sarah Nelmes, a milk-maid who had been accidentally inoculated with cow-pox from one of her master's cows. Jimmy went through his vaccination normally, as we see it today all over the civilized world. Two months later he was inoculated with virus taken from a person ill with smallpox, as a test of his protection. He did not take smallpox. This experiment was repeated upon many persons before it was given to the world, in 1798, by its distinguished discoverer.

Like some other great discoveries, this one, through ignorance, prejudice, etc., met with opposition, but its intrinsic merits finally overcame the opposition to a great extent and the

practice became established as one of the greatest life-saving measures known to the profession. The experience of more than a century has proven conclusively that efficient vaccination prevents smallpox. The protection is in direct ratio to the thoroughness of the procedure. Partial protection so modifies the virulence of the disease that it is comparatively free from danger. Modified smallpox, varioloid, as it is called, is contagious and gives rise to smallpox in the unvaccinated, thereby proving to be a serious menace to the community, just as a mild case of scarlet fever may produce one of great virulence, or as a smouldering rag may cause a conflagration. It is not a fatal affection, however, and, aside from its menace to others, is of no serious importance.

The evidence that vaccination practically prevents smallpox is overwhelming. Those countries that are most efficiently vaccinated suffer the least from the scourge. For years Germany has led the world in that respect. Efficient vaccination in infancy, childhood and young adult life has so thoroughly protected her people that she has no pest houses for the care of smallpox, as have other nations. She has been free from this disease for more than forty years, while the adjacent nations are never free from it.

Systematic vaccination by the surgeons of the United States Army in six provinces in the Philippines, having an approximate population of one million, reduced the annual smallpox mortality from 6,000 to nothing. During the succeeding five years there was not a death from this disease in this region of a vaccinated person. Eight hundred thousand natives of Porto Rico were vaccinated by the medical officers of the United States Army in 1898, with the result that smallpox was under control for the first time in the history of the island.

In 1885 smallpox broke out in Montreal and swept over the city like wildfire. The upper classes protected themselves by vaccination and escaped the disease. The ignorant classes refused vaccination and more than 3,000 perished from smallpox. The scourge finally burned itself out for lack of unprotected material.

From 1840 to 1874 the annual death rate from smallpox in Boston was about 100. In 1872-3 a severe epidemic sprang up in that city. Nearly 4,000 had the disease and more than a thousand died from it. The epidemic was finally controlled by general vaccination and isolation. An efficient board of health was created at that time and vaccination was made a condition for entrance to the public schools, thereby affording protection to the children of the careless, thoughtless and ignorant parents. Since that time this disease has been a negligible factor in the daily life of that city. Aside from a little flurry in 1902-3, the annual death rate from this disease has averaged less than two, and many years there has been none, a condition that never

obtained previous to the enactment of the mild compulsory vaccination law. The present generation in that city knows nothing of this disease from experience, many physicians even never having seen a case of it.

The experience of the city of Niagara Falls a few years ago is interesting. The pernicious influence of one or more opponents of vaccination had caused a large proportion of the 35,000 inhabitants to neglect vaccination. Smallpox broke out and spread over the city, until the state board of health was called in to check it. To avoid quarantine and to prevent the destruction of the tourist business, the local board of health finally got busy and over 20,000 of the inhabitants were vaccinated within a short time. As a result of this energetic and intelligent action, the epidemic was soon under control. The above examples of the benefits to be derived from vaccination are of official record and cannot be reasonably questioned. The other side of the subject may now receive our attention.

No reasonable advocate of vaccination claims that the procedure is entirely free from complications. Any accident or operation that breaks the skin, however slightly, may be followed by an infection, blood poisoning, as it is called in common parlance. Harmful germs, bacteria, may find entrance to the system through the most trivial wound unless prevented by well-known measures. The effects of infection depend upon the character of the noxious material, the condition of the individual, the treatment, etc. They vary from a discomfort, purely local and so slight as to be negligible, to a severe systemic disturbance with occasional serious consequences. Within the past ten years the writer has seen one death and two amputations of the arm following the prick of a needle, or the scratch of a pin. In half a century's experience he has never seen nor known of such misfortunes following vaccination. Sore arms are not uncommon, but the trouble is purely local and results in no permanent injury whatever.

Clean surgery is safe; none other is. Sterile wounds, *i. e.*, those free from noxious germs, however large and wherever located, usually heal safely and speedily. Vaccination is a surgical operation and hence should be done in accordance with the well-known rules of antiseptic surgery. And what is of even more importance, the after care should receive most careful attention. A clean arm, a clean needle, clean hands, a pure virus, intelligent after care, these are the essentials to success. Under these conditions the operation is one of the safest known to surgery. The complications are negligible.

Not infrequently, however, the operation is done without the above precautions and by those who know nothing of them. They are totally unfit to do even so slight an operation. Most

of the complications are due to neglect in the after care. Sore arms following vaccination are usually due to soiled clothing, and rubbing and scratching with dirty hands or fingernails. Any wound, however trivial, may be infected in this manner. The wonder is that more trouble does not occur under these conditions.

In these days there is no excuse for using impure vaccine virus. It is raised in young calves that have been carefully tested for those diseases to which they are liable. The process of vaccinating the animals is carried out with all possible antiseptic precautions. After the virus is collected, they are immediately killed and examined for any diseased condition. If such is found, the virus is destroyed. If the animals are found to be healthy, the virus is placed in cold storage for several weeks, during which time it is repeatedly examined and also tested upon guinea pigs to ascertain its purity and efficiency. If it comes up to the desired standard, it is then sealed in glass tubes and is ready for distribution. Heat, even of the vest pocket, ruins the virus. Some of the states raise virus and furnish it free of charge to citizens. During the past ten years Massachusetts has raised and distributed free of charge 814,412 doses of vaccine virus and thus far has received no complaint as to its purity or efficiency.

For how long a period does a single successful vaccination protect an individual? It varies greatly in different persons. Many physicians and nurses who attend smallpox patients are protected by one "take." They usually repeat the operation occasionally as a precaution, but one "take," followed at once by another trial as a test, will protect a large number permanently. Yet, as a trial is the only sure test, it is well for all who have not been vaccinated within five years to repeat the operation on being exposed to smallpox. This is the most certain method of protection. As a rule, those persons who have had smallpox, or varioloid, do not need vaccination under any circumstances. There are very few deaths from smallpox among vaccinated persons, even when many years have elapsed since the operation. Complete protection, however, does wear out in a certain proportion of cases, hence it is safer to repeat the operation occasionally until it is demonstrated that the susceptibility has lapsed. The German method is reasonably efficient.

Primary vaccination should be done during the first year of life as "cradle vaccination" causes comparatively little disturbance when properly performed. In adults the first vaccination with animal virus may cause considerable disturbance, but no permanent injury.

That diseases are not transmitted by vaccination in these days is evident from the fact that none exist in the animals from which the virus is taken. Furthermore, the affections alleged to be carried in that way, tuberculosis, tetanus, the social disease, etc., are as common in the un-

vaccinated as in the vaccinated. Even in the old days previous to the almost universal use of animal vaccine, when vaccination took place from arm to arm, it was the rarest of events for any affection to be conveyed in this way. Local infection in the shape of sore arms was common enough, as now, but systemic infection was almost unheard of. Careful investigation of the alleged serious results of vaccination usually showed that the trouble was due, not to the virus, but to the lack of care and skill in its performance and subsequent treatment.

It has been claimed that hygiene, isolation and quarantine would control smallpox without resorting to vaccination. Experience proves conclusively that this disease is not controllable in this way. Without vaccination it is as prevalent among the hygienic as among the other sort, in fact, in the Niagara Falls epidemic, it was even more prevalent among the upper classes.

Isolation and quarantine are practicable only during the actual presence of the disease. No one would think of resorting to these measures under other conditions. Furthermore, these measures would be of no use to those traveling in regions infested with smallpox. Some years ago an excursion party of Americans was broken up on arriving in Italy by this disease. The steamer was cleared and several hundred were turned adrift among strangers, some being without sufficient funds, and all found themselves in distressing conditions. Several persons had the disease. Efficient vaccination would have prevented the catastrophe.

It is natural that individuals who may have seen or experienced any of the disagreeable complications occasionally attending this operation should be prejudiced against it. This is human nature. A broader view of the subject is essential for deciding the real benefit to be derived from the procedure. The official and most reliable evidence the world over is overwhelmingly in its favor, so much so, in fact, that individual incidents should not be permitted to obscure the main facts in the case. No one would think of discarding steam or electricity from our modern life by reason of the occasional accidents resulting from their use. No more should this safeguard against a loathsome disease be given up by reason of an occasional mishap, especially as even that is avoidable.

Vaccination was never so safe nor so reliable as it is today. It has saved millions of lives. It has prevented an amount of suffering, mental and physical, that surpasses comprehension. The accidents attending the operation are usually avoidable and hence are a negligible factor. The advantages far outweigh the disadvantages. The intelligent portion of mankind the world over accepts the procedure. The risks are slight, so slight that they should not have any weight in deciding the question. They are of little consequence. The experience of more than a century

amply justifies confidence in the operation despite the hue and cry of a few woefully mistaken agitators who oppose it. If any event in human affairs has been demonstrated beyond a reasonable doubt, it is the great benefit to be derived from timely, efficient, skillful vaccination against smallpox.

Medical Progress.

RECENT PROGRESS IN PSYCHIATRY.

By HENRY R. STEDMAN, M.D., BROOKLINE, MASS.

(Concluded from page 367.)

FATTY DEGENERATION OF THE CEREBRAL CORTEX IN THE PSYCHOSES.

Cotton⁸ finds that in all degenerative alterations in the cerebral cortex, the mass of the lipid materials in the ganglion cells, in comparison with that in healthy individuals of equal age, is found to be considerably augmented. Two types in general may be distinguished; (a) An augmentation of the lipid materials in the ganglion cells, in places where normally a small amount of fat is found. (b) An augmentation of the lipid materials over the entire cell. The first type is also characteristic of senile dementia. The second type occurs in acute infectious psychoses, general paralysis, and well-advanced epilepsy. In young chronic cases of dementia precox, far-reaching fatty degeneration of the ganglion cells, especially in the second and third cortical strata, occurs comparable to the advanced lipid degeneration of the ganglion cells in senile dementia. The so-called central neuritis represents a peculiar disease process, according to the appearance of the fatty degeneration, since this fatty degeneration reaches a very advanced degree, and also in so far as it deviates from other disease processes in that here there comes out very distinctly in the picture an inclination of the fatty granules to flow together. Amaurotic idiocy also represents a particular disease process, in respect to the lipid degeneration, since here, in addition to otherwise distributed scarlet stain lipid materials, still other specific lipid materials make their appearance.

NATURE AND TREATMENT OF GENERAL PARALYSIS.

Marinesco⁹ holds that no hard and fast line can be drawn between general paralysis and cerebral syphilis, histologically speaking, and that cases where lesions of syphilis and of parasymphylis (so-called) co-exist are frequent. He quotes two cases of his own showing this. Again, in experimental syphilis in the rabbit, similar results have been obtained. Instances of conjugal

syphilis not infrequently point in the same direction. Marinesco does not believe in a special variety of the syphilitic virus which is neuro-toxic, but holds that soon after syphilitic infection, both the blood and the cerebro-spinal fluid are invaded by the spirochete. As neither of these is in reality a suitable medium for the cultivation of the organism, the latter has to fight for existence, especially if energetic treatment is undertaken. Some may resist and gradually develop, according to the site which they happen to occupy, cerebral or spinal syphilis, or, later, tabes or general paralysis. He thinks that the successful spirochete acquires secondary properties after it invades the nervous system. These properties, however, are neither permanent nor unalterable. No one has shown that the virus obtained from the brain of general paralytics, injected into the rabbit, produces lesions which are exclusively limited to the central nervous system.

TREATMENT OF PARESIS BY ENDO-LUMBAR INJECTION OF NEOSALVARSAN.

Contrary to Cotton's findings in this direction¹⁰ are the results obtained by Read.¹¹ Twenty cases of well-advanced paresis in male subjects were treated with 123 endo-lumbar injections of neosalvarsan, in doses ranging from .003 to .006 and .008 gram, diluted in at least 10 cc. of the patient's own fluid and given at intervals of two weeks. A number of patients received as high as ten doses. During the treatment, three patients died, but two of these were in the final stages of the disease when treatment was instituted, and death cannot be fairly attributed to interference. One case, already slightly spastic when received, became quite intensely spastic and died after about three months' treatment. Three patients suffered incontinence of urine, apparently as a result of dosages of .006 gram. A few complained of weakness, headache and leg pains from time to time, following treatment. A few had a slight rise of temperature for a short time following some treatments. One case of tabo-paresis developed a Charcot's joint during treatment. One suffered convulsions immediately after treatment, but had had other convulsions not connected with treatment. The Wassermann upon the blood serum in nine cases remained strongly positive. In one case it became negative and in another case it remained negative. The others were not tested. One negative and one faintly positive Wassermann in the spinal fluid became strongly positive.

A few favorable results were noted. In one case a very good remission began after a few treatments, but the spinal fluid findings are still positive. Others are markedly improved, but are still very evidently parietic. A number showed improved physical health. In three cases the Wassermann upon the spinal fluid became weaker.

Upon the basis of the above results, it seems fair to conclude that endo-lumbar treatment of paresis with neosalvarsan in small dosages (.003) is without effect, and that when the dose is increased, the results are extremely apt to be injurious. The use of neosalvarsan in this manner is to be discouraged.

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- ⁵ Russisch Vrach, Petrograd, xiv, No. 36.
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- ¹⁰ BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxiv, No. 8, Feb. 24, 1916, p. 8.
- ¹¹ Proceedings, Chicago Neurological Soc., Jour. Nerv. and Ment. Dis., November, Vol. 42, No. 11.

Reports of Societies.

NEW ENGLAND PEDIATRIC SOCIETY.

MEETING HELD AT THE BOSTON MEDICAL LIBRARY,
DECEMBER 10, 1915.

The President, DR. E. M. BUCKINGHAM of Boston, in the Chair.

The following papers were read:

1. Simple Incision in the Treatment of Pyloric Stenosis. J. S. STONE, M. D., BOSTON.
2. Spasmophilia—Report of Ten Cases—Etiology and Treatment. F. P. WEBSTER, M.D., PORTLAND, MAINE.
3. Fermentative Diarrhea in Infants.* L. W. HILL, M.D., BOSTON.

The following officers were elected for the ensuing year: President, Dr. A. C. Eastman of Springfield; vice president, Dr. Charles Hunter Dunn of Boston; secretary and treasurer, Dr. Richard M. Smith of Boston; member of Council for three years, Dr. John Lovett Morse.

DISCUSSION.

SIMPLE INCISION IN THE TREATMENT OF PYLORIC STENOSIS.

DR. VINCENT: Dr. Stone has referred to the cases which I have done at the Infants' Hospital. In the two years that have passed since the new Infants' Hospital was opened, we have had 12 cases of pyloric obstruction which came to operation. During that time, I have also operated upon three additional cases, one outside and two at the Massachusetts General Hospital. The operation in all these 15 cases was a posterior gastroenterostomy. Eleven of these cases had definite hypertrophic stenosis. They all presented the typical cartilage-like tumor at the pylorus which was felt under either or during the course of the routine abdominal examination. The other four were cases of partial

* See JOURNAL, page 487.

stenosis or what Dr. Stone referred to as cases of pyloric spasm. The 11 cases of hypertrophic stenosis made a good operation recovery. One died at the Children's Hospital of some form of acute intestinal obstruction a few months after the initial operation. As to the present condition of the two infants done at the Massachusetts General Hospital, I am unable to report at this time. The other eight cases have reported within the last two months, two by telephone and six in person in response to a request which we sent out in October. All of them are perfectly well. The condition of the six which reported for examination at the hospital was most encouraging. They were not only healthy, but robust children. This agrees with the experience of other surgeons and demonstrates that posterior gastroenterostomy need not have a high operative mortality and that the functional result is good. I grant that it is a harder operation than the splitting operation which Dr. Stone has described. My one operation of this kind was done some three years ago at the old Infants' Hospital on a very sick infant with an easily palpable pyloric tumor. In this instance, I feared that the child would not stand the longer operation as I split the pyloric tumor. On the second day there was separation of the abdominal incision which required secondary suture and the child died. The specimen showed a pylorus which easily admitted a lead pencil. The unfortunate complication in this case prevented one from drawing any conclusions except that the operation was quickly and easily performed and seemed to relieve the obstruction. Our experience with posterior gastroenterostomy for partial stenosis or spasm has not been so encouraging as with the cases of hypertrophic stenosis. Two of the four cases of partial stenosis came under observation a year ago and were finally operated upon because they were failing in spite of every kind of feeding. One died the day of operation and the other a week or two after the operation. The other two cases are in the hospital at the present time having been operated upon within the week. One was a difficult feeding case of nine months with a dilated stomach and a palpable pylorus, but no tumor. I did a posterior gastroenterostomy and the child will probably make an operative recovery, although the vomiting continues and the convalescence is stormy. The other case is an infant of a few weeks with a pylorus palpable at operation but no tumor or dilatation of the stomach. Vomiting also persists in this case and recovery seems doubtful. I feel that posterior gastroenterostomy is not an altogether satisfactory operation in these cases of partial stenosis. Certainly it does not give the good results which are obtained in the hypertrophic cases. For this reason I am disappointed to hear Dr. Stone say that, in his experience, the splitting operation is also unsatisfactory in these cases. As these cases of partial stenosis or spasm are suitable for surgical treatment it seems reasonable to expect that the problem might be solved by some such plastic operation on the pylorus.

DR. DIXON: I should like to explain the classification of these cases of pyloric stenosis which we are now using at the Infants' Hospital, which I think is a little different from Dr. Stone's. We are calling spasm only those cases which have no abnormal anatomical condition at all at the pylorus, and which show delayed emptying time of the stomach and visible peristalsis. We are calling

everything else hypertrophic stenosis of the pylorus, subdividing into complete and partial, and the difficulty comes in distinguishing always between the spasm cases and those which have only a partial stenosis, because both apparently have delayed emptying time. In looking over all the cases in which there was a suspicion of pyloric stenosis at all, we find that all the cases which were diagnosed as complete stenosis were operated on soon and got well; all the cases which we considered spasm also got well, and all the cases which we considered partial stenosis died, probably as the result of the difficulty in making the diagnosis.

DR. TALBOT: My impression of the emptying time of the stomach of these two conditions is confined to a few instances in which we have had x-rays of bismuth meals. In nearly complete stenosis of the pylorus, no bismuth goes through the pylorus. In what we considered spasm of the pylorus, almost immediately after a test meal of bismuth, it is seen squirting through the pylorus, and I assume that the delayed emptying time refers to the emptying of the entire contents of the stomach as a whole.

DR. MORSE: I have been very much interested in watching the cases of which Dr. Stone has spoken, and very favorably impressed by the operation. There is, of course, no question that babies do well after a good posterior gastroenterostomy. There seems to be no question, too, that, at any rate for a year, babies do just as well after this splitting of the pylorus as they do after the other operation. That being the case, it seems to me that an operation which takes less than ten minutes, with very little shock, is preferable to one which takes 35, 40 or 45 minutes and is accompanied by a considerable amount of shock. For this reason I shall certainly, for the present, recommend splitting of the pylorus rather than posterior gastroenterostomy. I am positive that one of these babies would never have come off the table alive from posterior gastroenterostomy operation. There is one thing to be remembered in the feeding of these cases, and that is, that the same rule must hold here as after posterior gastroenterostomy. If the intestine has been out of commission so long that it is all shrunken down and has not been in the habit of taking care of food, we must begin to feed very carefully, because the intestine is unable to take care of any considerable amount of food. If, however, the intestines are of good size and not shrunken, we can give considerable amounts of food from the beginning. It is important, therefore, for the operator to take note of the condition of the intestines at the time of the operation.

DR. LADD: In regard to the case operated on by Dr. Stone in July, which was under my care subsequently, the immediate effects of the operation as regards vomiting was not particularly apparent. The baby vomited a good deal, and for some weeks the feeding problem was a difficult one, but I feel that that operation did that child considerable good. The subsequent history has been very favorable, and now the baby has stopped vomiting entirely for several months, has gained a good deal in weight, and today weighs as much as the normal child of its age. Previous to the operation no progress whatever was made in its nutrition, although it was a breast-fed case.

DR. STONE, in closing: What I have called the spasm cases were those in which bismuth passed

through the pylorus as shown by the x-ray. The emptying of the stomach may have been retarded, but a considerable amount went through. Operation showed some slight thickening of the pylorus, but not the true pyloric tumor. The stormy convalescence in these cases of which I spoke, and which Dr. Vincent mentioned afterward, make me feel very strongly that the feeding plays a very important part. I would differ from Dr. Ladd in giving credit to the surgeon rather than in taking credit to himself. I think the feeding afterwards has done the most good, even though the operation may help materially. I wish that Dr. Vincent and others would try simple incision in some of the stenosis cases, because the operation is so simple, is so easy, and it has worked very well. The only drawback which I see is that pointed out by the house officers, who predict that the procedure is so simple that the medical men will be doing it in their offices.

SPASMOPHILIA—REPORT OF TEN CASES—ETIOLOGY AND TREATMENT.

DR. GROVER: I have heard quite a few of the doctors sitting near me ask what the preparation, larosan, is, and I would like to ask Dr. Webster if he will kindly explain to them what it is.

DR. WEBSTER: Larosan is a preparation of casein and lime. I don't know just the percentage of lime, but there is a considerable amount, and I estimate that it contains about 75% of casein.

DR. HILL: Recently I have made some analyses of larosan, and I find that it contains about 85% casein; I don't know just how much lime.

DR. MORSE: I certainly do not feel inclined to accept Dr. Webster's conclusions. He thinks that spasmophilia is due to the acid fermentation of carbohydrates or to whey. If this is the case, how can we explain the facts that the babies that are on breast milk do not have spasmophilia, and that when a baby with spasmophilia, that is having cow's milk mixtures, is put on breast milk the spasmophilia stops at once. How also can we explain the fact that when these babies are given barley water and sugar the spasmophilia will diminish or stop, to return when a little cow's milk is given. It certainly seems as if these points were very strong evidence against his theory. This is not the place nor is there any time to go into all the evidence which there is to show that spasmophilia is due to some disturbance of the salt metabolism, that is, either to a diminution in the retention of magnesium or calcium or to an increase in that of sodium and potassium. There is considerable evidence which goes to show that in some way this disturbance of the salt metabolism and retention is connected with the parathyroid gland. It seems to me that all we really can say about it is that there is some disturbance of the salt metabolism from some cause or other, and that at present no one knows exactly what this disturbance is, except that it is in all probability a disturbance in the proper relation between calcium and magnesium on the one hand, and sodium and potassium on the other. We have had a very interesting case in the Children's Hospital recently in a girl of eight years, well nourished and in perfectly good condition, who has had attacks of laryngismus stridulus, and in the beginning had typical attacks of tetany, with Trousseau's symptom, Chvostek's

symptom, and so on. We first gave her large amounts of calcium without any effect. Then we gave large amounts of parathyroid without any effect. Then we cut down the sodium and potassium without effect, and then Dr. Hill suggested some trouble with elimination, so we filled her up with water, with the result that the frequency and severity of the attacks immediately diminished. She certainly did not have any signs of acid fermentation, or any excessive amount of carbohydrates in her diet. Dr. Webster has spoken of water retention in these cases. I did not know that this was a symptom of the spasmophilic diathesis. I have seen swelling of the hands and feet in this condition, but it was of the nature of angioneurotic edema rather than of ordinary edema or water retention.

DR. TALBOT: True spasmophilia is certainly a very interesting disease, because we know so little about it, and as Dr. Morse says, the consensus of scientific evidence up to date is that it has something to do with salt metabolism, and apparently the sodium and potassium salts may have something to do with its course. About two weeks ago, we had a very interesting case which has some bearing upon this question. The child came into the hospital with a very violent acidosis. The amount of acetone in the urine was so large that the reaction was almost black. Soda was given, but was not held by the stomach. My house officer gave the patient potassium citrate in large amounts, and within a short time the child had very marked symptoms of tetany; the potassium citrate was stopped, and the symptoms of tetany disappeared. Potassium citrate was again started and the tetany reappeared, to disappear within twelve hours after the potassium was stopped. The tetany was shown in the typical positions of the hands and feet and by the Trousseau's and Chvostek's signs. I do not think we know any too much about the cause of spasmophilia up to date. The relation between the salt metabolism and the metabolism of carbohydrates is so intimate that it is quite conceivable that the proprietary foods, which are composed in large part of carbohydrate, may have an influence on the salt metabolism which may result in tetany.

DR. MILLER: I would like to mention a case which I have recently seen, which happens to be one of those cases which Dr. Morse spoke of, one of those rare cases of tetany in a breast-fed infant, a four-months old infant which came into my service at the Memorial Hospital, with a history of breast feeding whenever it cried, and who had had twenty days previous to entrance what were described as convulsions. It was a very emaciated infant, and when the clothing was removed it went into a tetanic convulsion and cried out, apparently with pain. I gave directions that it should be simply wrapped in blankets, and for two days we followed the case carefully to see whether ordinary milk mixtures would continue the convulsions, and they did. Then we put it on to a casein mixture with maltose and within twelve hours the convulsive seizures ceased and the child was apparently well contented, and to make it brief, the child rapidly improved in every way. I saw the child yesterday for the first time in two weeks, and I hardly knew it, it had improved so much. The fact that it had been previously on breast milk was what interested me greatly, and thinking there might be something about the family incidence of the dis-

ease, I had our social worker find out what she could about the habits of the family, and she reported that the parents are Italians, the child irregularly nourished; the mother was a regular daily drinker of beer, and the father drinks in considerable amounts. So we have an alcoholic parentage, with a beer-drinking mother. Whether this had any effect on the milk, I have no knowledge. As far as we were able to determine there were no other factors in the family history that might account for the condition which appeared in the baby.

DR. SMITH: These diseases of salt metabolism are confusing, because we know so little about the application of the knowledge of salt metabolism to the problems of infancy. I imagine it is not unlike the difficulty that was experienced a good many years ago when bacteria were first discovered. Various diseases were known to have a bacterial origin although the actual bacterium causing each disease could not be determined. It seems to me that at the present time a good deal of our confusion arises from the fact that we are considering in a single group several diseases, which subsequently will be separated. We know that the salt metabolism is at fault but not what particular salt or in what way. In this connection it is interesting to remember the work which Sedgwick has been doing on these diseases. It would seem from a certain number of cases there is a definite family incidence. He has been able to find an increased nervous excitability in parents of children with spasmophilia, indicating perhaps that the individual has a peculiar anatomical or physiological makeup, so that it requires only a slight stimulus to cause the explosion. These cases may be of different nature from the others. Also we ought to remember that there are a large number of these cases which respond very favorably to phosphorus and cod liver oil which is always procurable when breast milk is not.

DR. WEBSTER, in closing: I am very much pleased with the discussion which my paper has brought out. There are probably several conditions mixed together in some of the cases so that the diagnosis is not definite, as Dr. Morse has said, but as far as I can tell clinically, these cases might be called spasmophilia, some of them pretty definitely so. I do not think it is fair to compare breast milk and cow's milk. All attempts in the past to compare the two have been failures. In my experience, a baby fed on artificial food always has alkaline putrefactive stools. I believe that almost anyone would grant that a child fed on artificial food containing largely carbohydrates and having sour stools, that that child has acid fermentation of carbohydrates and that this is an undesirable condition. I should not say that acid fermentation was the cause of spasmophilia, but probably was a sign of excessive carbohydrate feeding. I have not gone into theories about the disturbance of inorganic salts, but have discussed these cases as they appeared to me clinically. The disturbance of the salts would not be considered as a cause, but as an effect. One of the most impressive points to me is that the patients have done so well. None of them have had any spasmophilia while fed on a food containing a low carbohydrate content.

FERMENTATIVE DIARRHOEA IN INFANTS.

DR. TALBOT: I have been very much interested in Dr. Hill's paper, in which I think he has pre-

sented a very difficult subject in a very clear way. I personally find it very difficult to draw the line clinically between the cases of indigestion, which we call indigestion due to carbohydrates, and fermental diarrheas, and I wonder what Dr. Hill's criteria were in these cases?

DR. HILL: I do not think that there can be any line drawn between the two. Some of these cases might be called indigestion with fermentation, and some of them carbohydrate indigestion, but I have called a case carbohydrate indigestion or indigestion with fermentation when the baby was not doing well and having too many stools of an acid character.

DR. WEBSTER: I have been very much interested in listening to Dr. Hill's paper, since in the last few years my experience has been that fermental diarrhea is much more common than infectious diarrhea. In fact, infectious diarrhea has been the exception in Portland. Two summers ago, I saw some 60 cases and in my opinion about 50 of them were of the fermental type. I have never published a report of them as I have been anxious to learn more about this subject, and to me Dr. Hill's paper is very instructive. It is not necessary to have acid stools in intestinal fermentation. When you have acid stools I always believed that you have intestinal fermentation, although he says you may have infectious diarrhea. When the stools are alkaline you may have fermentation since a mucous stool is always alkaline. You must have a stool which contains some food residue in order to tell whether there is fermentation. I had supposed that the presence of blood in the stools was a symptom of infectious diarrhea, but I have several times seen blood in the stools in intestinal fermentation, and have in a few cases seen excoriations running up into the anus along with the sore buttocks.

I wish to change one statement I made in replying to Dr. Morse about the stools being acid. I have once in the last few months seen a child with acid stools from fat, and probably here in Boston those stools are more common, that is, the fatty acid stools, because of the use of cream, but practically always when I see acid stools it is after fermentation, in which the diagnosis can be corroborated by the percentages and by the therapeutic test, and I think the odor is different. This is a matter of experience. One thing that I omitted to say in the discussion is that there are different kinds of acid fermentation, which make a difference.

CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

DECEMBER 14, 1915.

DR. J. RAMSAY HUNT in the chair.

ACROMEGALY WITH EXTREME DEGREE OF EXOPHTHALMOS.

DR. WALTER BAER WEIDLER presented from the first division:

Mr. M. S., aet. 37, Hebrew; occupation, upholsterer. Patient complained of pains in the legs since June 7, 1914, especially in the calves and the

knees, and of a feeling of weakness in the lower extremities when he walks. Aside from this, there was no complaint. He maintained that the symptoms had been in existence about four months before this date, and during that time he had lost considerable weight,—about 20 pounds.

Examination when first seen revealed the typical physical signs of acromegaly in a very early stage, all of them less conspicuous than at the present time. I believe that you will agree with me they are characteristic, plus an additional condition occasionally present, *i.e.* exophthalmos. We see striking features of his cephalic extremity in addition to the exophthalmos, the protuberant orbital arches, with a luxuriant growth of coarse hair, the enlarged nose and ears and the prognathus jaw, the protruding, overhanging under lip, the enlarged and fissured tongue. The only extremities characteristically enlarged are manual. The fingers are the characteristic sausage shape; the hands themselves are lacking the pads, which are rather thin in the thenar and hypothenar sides. The skin of the fingers lays in longitudinal folds, the nails are pyriform and glistening. His stature is rather characteristic of the disease, and the protruding abdomen and the rounded shoulders being distinctive features. The feet are not particularly large nor is there any evidence yet of the projecting of the os calcis. The pulse rate is from 76 to 84.

In the 18 months that have elapsed since this patient came to the dispensary, the cachexia, if that is the proper name for it, upon which his symptoms are dependent, has gradually increased.

He has not worked for a year because he is too weak. The symptoms that impaired his working capacity came on rather suddenly.

Urine normal; no increased sugar tolerance. Wassermann negative. His eyes became more prominent, began to complain of frontal headaches, and the general physical weakness increased rapidly.

The eye examination by Dr. Holden June 15, 1914, revealed no gross ocular changes.

November 25, 1915, Dr. Holden found the following condition: 02 pupils, right 2.5 mm., left 3 mm.; and the reaction to light and convergence was sluggish. Diplopia at times and restricted movements of eyes upwards. There was well-marked exophthalmos with normal vision, fields and fundi.

My first examination of this patient's eyes was Dec. 6, 1915, just one year and a half after the onset of the disease. 02 pupils, 3 mm.; iris blue, react to light sluggishly but active to accommodation and convergence, and the tension normal. The corneal sensation was normal in spite of the exophthalmos, which amounts to about 10 or 12 mm. Vision: right 20/20? Left 20/20? Type I. Accommodation 13-30 cm.

The ophthalmoscopic examination:

Right eye: media clear, disc oval 7 by 8 mm., long axis 75°, scleral ring all around, central excavation small, with quite a decided pallor of the papillomacular bundle. The veins are dark and full, vessels long axis 90°.

Left eye: media clear, disc oval 7 by 8 mm., long axis 90°, scleral ring all around, central excavation small, with pallor of the temporal half of the disc, veins dark and full, with well-marked venous pulse, vessels long axis 90°.

The very pronounced exophthalmos makes it quite easy to demonstrate the Von Graefe, Dalrymple,

Stellwag and Gifford signs, generally present in Graves' disease.

There is a marked limitation of movement of the eyes upward and outward, and with little or no power of convergence. The fields taken Dec. 14, 1915, show in the right eye enlargement of the limits for white due to the exophthalmos, but a marked contraction for red and blue, and more especially for green, which is reduced to the 10 mm. circle. There is no scotoma.

The left eye shows the enlargement of the field for white, but a dischromatopsia for the red and blue. This was noted quite often in the first cases seen by Cushing, but has not been demonstrated in his later work. The green is reduced to the 10 mm. circle. There was no true scotoma found, but one was able to show the tendency towards a "fatigue field" in the left eye.

The x-ray plate, made by Dr. Law of the Manhattan Eye and Ear Hospital, showed some enlargement of the base of the sella and also of the posterior clinoid process, which might be considered quite sufficient to explain the changes in the fields. The marked reduction of the green field should be taken as evidence of the earliest degeneration in the optic nerve.

Summary:

1. The gradual onset and progress of the cephalic changes, but more especially of the brows, ears, nose and lower jaw, the protruding abdomen, sloping shoulders, trouble with the feet and hands.
2. The gradual decrease of sexual desire and sexual power, and loss of physical strength.
3. The exophthalmos and changes noted in the field of vision make one think that this is a case of acromegaly without any of the well-marked symptoms, which will undoubtedly be present in a later stage of this patient's disease.

A CASE OF HEREDITARY TREMOR.

DR. C. BURNS CRAIG presented from the first division an extremely interesting variety of tremor, most probably hereditary. It is especially interesting in that it can be traced through three generations, and is associated with and probably originally caused by alcoholism. The patient states that he first noticed the shaking of his head when he was about six years old; fright, excitement or nervous tension would cause him to tremble all over. He noticed during his first year in school that when he was sent to the blackboard his head would tremble from side to side, which disconcerted him so that he was practically unable to carry out a task before the school. He noticed during his high school work that his hand trembled in writing, although he had gotten along fairly well in his studies, and had been able to keep up with his class. He acquired a taste for alcohol as early as his sixteenth or seventeenth year, and has been addicted to its use ever since, he being now 26 years of age. He has been not only a rather constant drinker, which he thought was necessary for its bracing effect, but indulged in latter years in weekly sprees. Since leaving high school he has been working in a responsible position as a bookkeeper in an insurance office; he was there subjected to a great deal of good-natured gibing because of his infirmity, as the slightest excitability provoked the shaking of the head to a greater degree. Sixteen months ago he contracted venereal infection, which caused him great anxiety, so that he resorted more and more to the use of alcohol.

Since that time the shaking of the head had become so violent that he was too greatly embarrassed to continue in the office. His decision to leave was hastened by the fact that he had been criticized because of his poor writing, the result of his shaking hand. Three weeks ago I saw this patient and advised him that the more vigorous life on a farm, where the less delicate movements of his hands were called for, where there would be a small group of people, with whom he would become intimate, and among whom his embarrassment and self-consciousness would disappear, to say nothing of the more healthful manner of life as compared to an office, would be the ideal future for him. He accepted the advice and went to the farm of an aunt, herself an alcoholic. From this place he returned in a week in a state so lacking in poise that his tremor, which extended from his neck into his trunk, would almost lift him from his chair. During his absence he had proceeded to drink a large quantity of alcohol. He was admitted to the Hospital Nov. 28, 1915. That night he manifested the restlessness and, indeed, violence of an incipient delirium tremens, necessitating restraint. His state of agitation has quieted down since that time, but there has remained a mental state in which both orientation, attention and memory are greatly impaired. In certain phases he presents both hallucinations and delusions. Physically he is a fair, tall, broad-shouldered man of average physique. He has what is ordinarily called a weak face, lacking both vigor and decisiveness. As he lies in bed there are present frequent coarse tremors throughout the neck and trunk, which become accentuated in the presence of strangers. These contractions may be seen in both the muscles of the chest, abdomen, and back. His pupils are equal and round and react promptly to light and in accommodation. The tendon reflexes are all equal and active. His strength is good and coordination observed, although the tremor is increased by intention. There is no nystagmus or ocular trouble. The heart is negative; his blood pressure is 125. The familiar nature of this tremor may be presented as follows:

The patient's grandfather was a steady drinker (see family tree), and had, as long as the patient or his mother can remember, a tremor of the neck. This man had three children, the father of the patient, who was also a chronic alcoholic throughout his life, indulging in frequent spees, but manifesting no tremor or muscular instability. The patient's uncle was not a drinking man, nor did he have a tremor. He did not marry. The patient's aunt, who remained single, is both a chronic alcoholic and has a marked tremor of the head. In the patient's family there are two boys and three girls; the patient himself manifesting tremor and being a

chronic alcoholic; a sister of 35, who has a constant tremor of the head, and occasionally of the hands, but who does not indulge in alcohol; a sister of 33, who has a constant head tremor, and trembles all over when excited, neither does she indulge in alcohol. In both these sisters the tremor of the neck began in childhood. A sister 30 years of age, who is said to be of a nervous temperament, manifests no tremor. The youngest member of the family, a boy of 22, is said to tremble in an obvious manner when excited. We thus have three members of the family presenting various degrees of a similar tremor, coming from an alcoholic father who had no tremor, but whose sister is also a chronic alcoholic and has been all her life afflicted with a tremor. These two are in turn the offspring of a parent who was both alcoholic and presented a tremor of the neck.

A CASE OF CHRONIC LEAD INTOXICATION.

DR. WALTER CLARK HAUPT, in presenting this case from the first division said that it was particularly interesting inasmuch as none of the usual symptoms of plumbism—lead-line, anemia, basophilia, palsies, arthralgias, arteriosclerosis, or encephalopathy,—were present, and a differentiation between the patient's neurasthenic reaction and symptoms referable to chronic metallic poisoning was difficult.

The patient was admitted to the hospital Nov. 19, 1915. His complaints were: profuse perspiration, pins and needles sensation all over the body, "creeping and crawling under the skin with a sensation as if wind were blowing over the skin while it was burning underneath," girdle sensation, attacks of dizziness and confusion, constant feeling of swaying back and forth, pain in the calf muscles, needle-like pain during urination, constipation, and impaired sexual power.

The patient is a Roumanian Jew, 32 years of age. Has had two attacks of enteric fever at 13 and 16, respectively, but no other serious illness.

At the age of 17 he took up the trade of house-painting, which he followed continuously up to two years ago, and also during the past summer. In his work he used white lead paints extensively, as well as red lead paints and varnish. He handled putty very frequently. He mixed his paints with turpentine or benzine. He admits that he was extremely indifferent in regard to washing his hands or even wiping off some of the paint before eating. He drank moderately and smoked excessively. For the past ten years his bowels have been very constipated, moving only every second or third day after taking a physic.

Ten years ago he married and his wife had four children and one miscarriage. Before marriage he

FAMILY TREE.

Grandfather, alcoholic, tremor of head.

Father, alcoholic.

Uncle, no alcohol, no tremor, single.

Aunt, alcoholic, tremor of head, single.

Sister, 35 years, tremor of head and hands, non-alcoholic.

Sister 33 years, trembles when excited, non-alcoholic.

Sister, 30 years, nervous, excitable.

Patient, 26 years, tremor of head and hands, alcoholic.

Brother, 22 years, trembles when excited.

was addicted to onanism for nine years, and claims to have had spermatorrhea for a long time. He denies venereal infection.

About five years ago, he had for the first time a sensation of tightness and constriction around the waist. "It felt," he says, "as if someone had tied a tight bandage around my waist, and inside it burned all round,—in front, in back, and at the sides." Similar attacks, which varied in duration, would recur about once in every four weeks. He would bend his body forward, but found no relief, until he pressed the hands on the lower part of the back and hyperextended the trunk; this would decrease the sensation of tightness, and burning was lessened. Four and a half years ago, he began to have sticking pain in the epigastrium, which came on about twice a week. At the same time he would feel a similar pain below the left clavicle and above the left scapula. Six months later the sensation of tightness and burning around the abdomen began to be associated with severe cramps in his stomach, which made him moan and double up with pain.

Three years ago he first noticed that whenever he entered a freshly painted room or whenever he smelt fresh paint his face would break out in perspiration. He remembers also that when mixing paints that drops of sweat would drip down. This occurred, even in the coldest weather. He observed at the same time that his forearms and hands were covered with beads of perspiration. Whenever he had an opportunity, he left his work to get fresh air; this would relieve him and he could breathe easier. He found soon that he perspired more freely over his whole body at all times and wherever he might be. The lower part of his back seemed to perspire more than any other part of the body.

At this time he also first began to have the sensation of creeping and crawling underneath the skin, associated with trembling of his head, limbs, and body, and likewise the feeling of something burning under his skin, while a draft of cold air seemed to blow over the surface. He also began to have frequent retching and eructation of gas, as well as dryness of the mouth and throat, symptoms which were especially marked when he smelled fresh paint.

In this period falls also the beginning of the sensation of swaying backward and forward. He remembers that he first noticed this symptom while riding in an elevator. He felt as if someone had suddenly given him a push from behind and then someone else from in front, and as if this were being repeated over and over again. His heart beat rapidly, and his friends told him that he was pale in the face and perspiring. When he got out on the street he felt dizzy and confused, not knowing exactly which way to turn to go home. He perspired profusely that night and had to have three changes of night clothes. Ever since that time he has constantly had this sensation of swaying back and forth, and when walking on the street has felt as if he were going to fall. He has often had to steady himself against a wall. During these attacks he is quite confused as to his whereabouts, and is seized by a fear of sudden death.

For the past two years he has had attacks of pain on attempting to urinate, coming on about three times a week. Last summer he saw blood in his urine on two occasions.

Two years ago he had occasional diplopia for an indefinite length of time. He remembers that while eating he would see two knives. For the past year he has had frequent nausea after eating and occa-

sional vomiting. Although the patient had insisted all along that he had not done any work for two years and that his symptoms had not been ameliorated, he finally confessed that he had painted all last summer, but had withheld the fact as he was being supported by charity. His symptoms became more pronounced this autumn.

Physical examination shows the patient to be a well-developed, well-nourished muscular man. His weight is 156. His hands and feet were moist and cold. Only a suggestion of moisture over his lumbar region could be noted, although he complained at the time that he was covered with perspiration. During the examination he thought repeatedly that he was going to vomit, and there was considerable retching. Although the room, which did smell of fresh paint, was warm, he complained of the cold. His hands and lips trembled and his whole body shivered. On placing the palm of the hand on the patient's skin, one had the sensation of innumerable mild electric shocks. While testing the muscular power of his lower extremities, the patient was seized with severe cramps of his calf muscles; the gastrocnemii felt as hard as rock and the patient cried out with pain.

Examination of cardio-respiratory system was negative; the pulse was 80, blood pressure 120. The abdomen was negative. The teeth were carious, and there was marked pyorrhea, with the characteristic blue line present and the breath was fetid. There were two dime-sized grayish patches on the gums below the last two molars on either side. A lead line could not be detected. The protruded tongue and the lips were tremulous. The gait was occasionally staggering. On standing, a general tremulousness and swaying back and forth, increased by closure of the eyes, were manifest. There was no tendency to fall in any particular direction.

The cranial nerves were normal. Dr. Holden found an old sclerorochoroiditis and myopia, somewhat edematous discs with blurred margins and very narrow arteries.

There was slight tremor of the outstretched hands. The lower extremities were normal, save hyperactivity of the tendon jerks. The only objective disturbance of sensation found was a distinct hypaesthesia and hypalgnesia of the legs, beginning below the knees. The superficial reflexes were all normal.

The Wassermann of the reaction blood serum and of the spinal fluid was negative. There was no pleocytosis or excess of globulin in the latter.

His blood count was 4,962,000 red cells and 12,000 leucocytes; hemoglobin 91%. The differential count showed 4% eosinophiles. Gastric contents and feces were negative. A single specimen of urine was found to be normal. A 24-hour specimen, sent to Dr. A. S. Wolf, who examined it by the electrolytic process, showed the presence of a trace of lead.

This patient, with definite neuropathic tendencies, developed, after working many years with lead paints, a girdle sensation, attacks of colic, certain indefinite paresthesiae, headache, dizziness, constipation, nausea and occasional vomiting. He shows none of the usual signs of plumbism, but a trace of lead is found in his urine. It is difficult to differentiate clearly between the patient's neurasthenic reactions and symptoms definitely referable to the presence of lead compounds in his system. It might be argued that patient's symptoms did not develop until ten years after he had begun to handle

pains, and that his condition, one which is apt to develop in an individual of his race and with his sexual history, should be considered a neurosis. Against that may be said that lead may be stored in the system for years without giving rise to any trouble until the metabolism is deranged, and, furthermore, the patient's first symptoms were constipation, attacks of colic and girdle sensation, which are known to result from lead intoxication. Other complaints of the patient, as headache, dizziness, dry throat, painful urination, pain in the back, staggering gait, have been observed in persons exposed for longer periods to the harmful emanations from freshly-painted surfaces, particularly to turpentine.

In view of the demonstration of lead in the patient's urine, which has been called the surest sign of lead poisoning, and of the history of many years of contact with lead paint, as well as the definite onset of symptoms, we must regard this case as one of chronic lead intoxication, many symptoms of which we are unable, in the light of our present knowledge to separate clearly from purely neuros-thenic reactions which might be expected in this individual.

SYNDROME OF COMPRESSION OF THE CAUDA EQUINA.

DR. JAMES L. JOUGHIN, from the first division, presented a patient showing evidences of pressure on the cauda equina. The family history of the patient, a male aged 38, is negative, as is his history until the age of 12. At that time he began to suffer from a severe pain originating in the left hip, which extended down the back of the thigh and the outer surface of the leg. At about this time, but he does not recollect whether before or after the onset of these initial pains, he received from a playmate a severe blow in the lower lumbar or sacral region, which knocked him down and resulted in considerable pain and stiffness in that region for the ensuing few days. When 15 years old pain in the sacral region first manifested itself, disappearing on repose, reappearing on assuming the erect posture and becoming extremely severe and lancinating on bending forward or either directly or indirectly jarring the spine. At the age of 19 a severe attack of left-sided sciatica occurred (the first of a series of acute attacks), subsequently to which he limped for a period of six or nine months, and during this time he was unable completely to extend the legs, owing to the severe pain caused in the thigh and sacral region by this manoeuvre. However, recovery was so complete that he enlisted in the army when 21 and received his discharge papers three years later, having experienced very little difficulty with the leg during his term of service. On assuming civil life he again retrogressed and during the two years following his discharge, his condition was similar to that which had existed during his years of adolescence with this reservation, that the pain at times assumed the bilateral type. Following this came an absolute recession of all symptoms for three years, until the age of 30, when he experienced a second acute attack of sciatica, for the first time bilateral, but much more severe in the left leg. A second complete recession of all symptoms then occurred, lasting for four years. During this interval, however, he could produce pain in the sacral region or the hip by coming down heavily on his heels or seating himself in an abrupt manner on a hard chair. At the expiration of this time (age 34) a third

acute attack of sciatica supervened, as the second, bilateral, but differing from it in that the right leg and not the left, was most affected, and this pain and disability has ever since persisted in that member.

Eighteen months ago paresthesiae, "pins and needles" sensations, etc., developed in both lower extremities, but within a few weeks disappeared from the left leg. On the right, however, these "tingling" sensations persisted for months, and now are gradually being replaced by a numb or dead feeling distributed in the same area.

One year ago his sexual power began to decrease, and he is now rapidly becoming completely impotent. Nine months ago he noticed that on days when his paresthesiae were very pronounced, the right side of the penis and of the rectum also became numb. This symptom is also increasing in intensity. He thinks his penis and testes have been slowly decreasing in size. Two months ago his left leg began again to tingle, and sharp shooting pains, at first only occasionally, now several times daily, run from the hip down the center of the back of the thigh and the other side of the leg, a distribution similar to that which all the sensory phenomena have manifested throughout the entire course of the disease. A sensation of "giving away" of his legs, more often on the right, has only recently developed. Walking a few blocks induces this and also intensifies the sensory phenomena. After a short rest he again can properly control his leg and continue his walk without fear of falling. His sphincters have been so far unaffected by the progress of the malady. Only his positive physical findings will be given. He stands preferably with the trunk inclined to the right and with the full body weight thrown on the lower limb of that side. The abdominal reflexes are not obtained, probably due to the obese abdomen. The only abnormality in the tendon reflexes is the absent ankle jerk. On the left this can be brought out by reinforcement, but it cannot be similarly elicited on the right. Once or twice a very slight ataxia of the right leg was demonstrable, but usually this was not evident. Fibrillation has been seen in the right calf. Muscular power is intact.

The objective sensory modification consists of a varying degree of hypesthesia (right side) to all modalities of sensibility, attaining its maximum intensity on the sole and outer half of the dorsum of the foot. The circles of Weber are definitely enlarged in these areas. The intensity of the sensory loss is not always the same, sometimes the hypesthesia is very distinct, at other times less so, nor are the limits apparently always identical, although nearly so. This hypesthesia is sequential in its distribution and it is found in the cutaneous areas in relation to the 5th lumbar and all the sacral segments, though most pronounced in the areas supplied by the 5th lumbar and 1st and 2d sacral segments. Postural sense in the toes of the right foot is also deficient. There is considerable tenderness on percussion over the upper portion of the sacrum and the last lumbar vertebra. The blood and cerebrospinal fluid report were negative.

The x-ray plate revealed an ankylosis existing between the 4th and 5th lumbar vertebrae and also showed a pronounced and extensive shadow in relation to the sacrum and 5th lumbar vertebrae, the lower border of which had a very distinct semi-circular outline. The density of this shadow on the left side was very much greater than on the right,

so much so that it was very suggestive of bone formation.

What the pathological condition here may be is largely a matter of conjecture and cannot be definitely determined until we are enabled to present the operative findings, which we hope to do at a future conference.

Harvard Medical School.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, ON TUESDAY EVENING, MARCH 21ST, AT 8.15 O'CLOCK.

Dr. H. A. CHRISTIAN, president, in the chair.

Dr. Chase: Report with Lantern Demonstration of Good Functional Results Following an Operation for Fracture of the Scaphoid Bone, and Dislocation of the Semilunar Bone.

Paper of Dr. L. H. Newburgh, Dr. J. H. Means, and Professor W. T. Porter: Studies in Experimental Pneumonia.

The experiments reported at this time concern the respiration in pneumonia. They have to do with the respiratory difficulties of this disease.

The method used depends on the fact that the carbon dioxide content of the blood increases when an animal breathes in a closed system. By means of a spirometer the quantities of gas respired can be measured. An analysis of a sample gives the quantity of CO_2 at any given time.

The first series of experiments was carried out on cats to determine whether cats with pneumonia respond to the stimulus of CO_2 as normal cats do. For this purpose the animals were divided into three groups: normal cats, cats moderately ill with pneumonia, and cats nearly dead with the disease. From the results it appears that in normal animals with 3% CO_2 , the breathing is increased by 98%; in cats moderately ill it is increased by 43%; and in cats nearly dead with pneumonia, the breathing is increased only 7%.

These experiments were repeated using dogs instead of cats. The CO_2 content of the respired air was raised to 5%. Similar results were obtained showing that in pneumonia there is a very marked decrease in the ability of the respiratory center to react to CO_2 . The decrease is progressive as the disease advances.

These findings naturally lead to the query regarding the cause of this reaction in the path of the respiratory center. In order to determine what was responsible for the reaction, an attempt was made to investigate experimentally all of the factors likely to influence the respiration in pneumonia. From the first series of experiments, the conclusion may be drawn that the decrease in the ability of the center to react to CO_2 , is not due to a mechanical factor. The results from a second series, demonstrated an absence of any parallelism between the amount of consolidation and the extent of the reaction.

The effect of toxins on the respiratory center was found in the third group of animals. It was

found that the failure of the center to react to CO_2 , was not due to the toxemia, or whatever poisons are produced by the micro-organisms.

In the fourth series, the results were conclusively against any assumption that a chemical substance generated in the lungs was responsible for this reaction.

The lack of oxygen was considered in the fifth set of experiments. Many workers have suspected that there is a close connection between the degree of dyspnea, and the reaction of the respiratory mechanism. The findings, however, were entirely out of harmony with such a view.

In the final series the effect of the vagus nerve on the center was studied. The experiments showed that the difficulty with respiration is apparently the result of stimuli which arise in the lung and pass up the vagus to the medulla. These stimuli in some way injure the cells of the medulla so that they cannot react to the CO_2 .

DISCUSSION.

Dr. MEANS: Kymographic studies carried out on a patient with an artificial pneumothorax, have given certain results which substantiate the experimental work just outlined. In this case, the vital capacity had been observed before the onset of the tuberculosis. It was about two and one-half liters. Subsequent to the establishment of the pneumothorax, it was found to be only about one-half this amount. There were no signs of dyspnea, however. With only one lung the patient could increase her ventilation like a normal subject. The great reduction in the lung surface apparently led to no reduction in the curve of CO_2 .

Dr. PEABODY: It is clear that this is an exceedingly complicated subject. I wish to congratulate the workers on their splendid results. Apparently they have controlled the experiments from all points of view. This finding of the vagus nerve factor opens up an entirely new field, particularly from the clinical standpoint. The field of the nervous regulation of respiration is a pretty obscure one, and it is especially so to the clinicians.

Dr. COUNCILMAN: This paper has called up two points of interest. One of these is the enormous capacity of the lungs to function efficiently under very great difficulties. Pathological findings repeatedly demonstrate that an enormous proportion of lung tissue may be destroyed without seriously interfering with the respiratory exchange. The second point is that recent work has shown the interest clinicians are now taking in respiration. The clinical and experimental work in this field has already added very materially to our knowledge.

Dr. CHRISTIAN: For a long time clinicians have noted that some patients with pneumonia are relatively comfortable; while others are extremely uncomfortable. No definite relation, however, has been found between the area of consolidation and respiratory distress. It has always been taught that this is to be explained by the amount of toxemia, acting directly on the respiratory and vasomotor centers. The work presented tonight, however, completely upsets this explanation. It leads to interesting speculations as to whether the nervous factor is due to disturbances in the vagal terminations in the lung, or to changes in the trunk of the nerve itself. We are very greatly indebted to these observers for this valuable contribution.

Paper of DR. A. A. GHOREYEB: Studies of the Renal and Coronary Circulations.

The object of this work has been to determine whether a compensatory hypertrophy of the intrinsic arteries accompanies a hypertrophy of any organ, such as the heart or the kidney. The first experiments concerned the capacity of the average-sized coronary arteries. After two or more years of work with casts made by injecting the vessels with a composition metal, it was found that one gram of heart is equivalent to 0.433 grams of the metal. Since the error in a series of hearts consecutively injected proved to be less than one gram, it became apparent that the method was a safe one to use for experimental purposes.

Lambs' and sheep hearts were used. In the earlier portion of the work, only the hearts from young animals were used. Subsequent studies with older organs demonstrated that as the heart grows larger, the vascular supply (coronary vessels) does not increase at a proportional rate.

In the second part of this work, the effects of disease on the renal arterial system in man were investigated along similar lines. In nephritis the vascular supply of the kidneys was found to be greatly reduced.

(Lantern slides of casts were shown illustrating the vascular supply of hearts and kidneys).

DISCUSSION.

DR. CHRISTIAN: The findings just pointed out regarding the circulation in young and adult hearts, and the fact that hypertrophied hearts have no corresponding increase in vascular supply, may explain why degenerations occur in such cardiac conditions. The same explanation may apply to the decrease in function of nephropathies. It may be that too much emphasis has been laid on epithelial changes, and too little on the circulation in explaining the decreases noted in renal function test.

DR. BARNEY: In the text-books the statement is usually made that an atrophy of the kidney always follows the ligation of the ureter. A hydronephrosis is never discovered in such a case. In a series of animal experiments which I have carried out, however, I found that hydronephrosis always results from ureteral ligation. By means of gelatin injections, it was possible to demonstrate numerous anastomosing veins in the kidney capsules in such specimens. Such anastomoses probably explain the absence of atrophic changes.

In certain animals when the kidneys were de-capsulated at the time of the ureteral ligations, the kidneys underwent atrophic instead of hydronephrotic degenerations. The experiments as a whole showed that if the circulation in the capsule (anastomosing veins) was interfered with after the ureter had been tied off, hydronephrosis did not occur.

ERNEST G. GREY, M.D.

NEW HARVARD UNIT. It is announced that a new surgical unit has been organized at the Harvard Medical School, under the direction of Dr. Harvey Cushing, Dr. Richard P. Strong, Dr. John Warren and Dr. Roger I. Lee. This unit will be composed of twenty surgeons, physicians and bacteriologists, and is intended as a mobile base hospital unit to supply emergencies and fill vacancies in the unit on service at the British base hospital in France.

Book Reviews.

The Obstetrical Quiz for Nurses. By HILDA ELIZABETH CARLSON. New York: The Reiman Company. 1915.

This book is of the same plan as the quiz compends which are published for the use of medical students. This volume in particular is unintelligently compiled and cannot be regarded as a safe book to put in the hands of any nurse.

Principles and Practice of Obstetrics. By JOSEPH B. DELEE, A.M., M.D. Professor of Obstetrics at Northwestern University Medical School. Second edition, large octavo, 1087 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1915.

The fact that this book has come to its second edition with three printings of its first in two years shows its popularity. It is unquestionably an excellent obstetric reference book.

Curschmann's Text Book of Nervous Diseases. Translated by CHARLES W. BURR, Prof. of Mental Diseases, Univ. of Penn.; Neurologist to the Philadelphia General Hospital. Two vols. Philadelphia: P. Blakiston's Son and Co. 1915.

A review of this text-book as a whole would take more space than we are able to devote to it. It must suffice to state that Curschmann's Text-book of Nervous Diseases has been well known as a most valuable work ever since its publication in German a few years ago. The articles, which are by different writers, are all by men who are recognized as leaders in the study of the subjects upon which they have been asked to write, and men of large practical experience, whose treatment of the subjects given to them has been sane and wise and thoroughly adequate. The section written by Dr. Burr himself, the one upon the diagnosis and treatment of neurasthenia, psychasthenia, hysteria, and borderland mental states, is well worth careful study, perhaps especially in regard to his treatment of the subject of borderland mental states, conditions in which he has had exceptionally large experience. The translation appears to be entirely adequate, and as one would expect, shows practically none of the usual ear marks of a translation from the German. The book is extremely well printed, and the illustrations also, and if any criticism may be made in this regard, it can be only in the nature of a regret that the careful production has made so large a price necessary that the book is not likely to have as wide a circulation among the profession as it deserves.

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INDUSTRIAL HEALTH INSURANCE.

REFERRING to our comment on the bill for industrial health insurance in editorials in the issues of the JOURNAL for January 6 and February 24, 1916, we have received a copy of House Bill No. 1015, now before the Massachusetts Legislature. It is a long bill but may be summarized as follows: Every person employed in the Commonwealth for compensation not in excess of one hundred dollars a month, except in the case of employees of the United States, those for whom sick benefits have been otherwise provided and a few others as specified, shall be insured as regards their health in an association to be maintained by contributions to reserve and guarantee funds and expenses by employers at the rate of two-fifths, employees, two-fifths, and the Commonwealth, one-fifth. The insurance is to be handled by three commissioners, appointed by the Governor for six-year terms of office, each commissioner to devote his entire time to the

duties of his office, the chairman to receive a salary of \$4,500 and the other two commissioners \$4,000 each, the secretary receiving a salary of \$3,600.

Thus, exclusive of the expense to the State of the one-fifth of the cost of the actual insurance, an unknown sum, the bill calls for an expenditure of \$16,100 for salaries, not including office expenses as appropriated by the Legislature. Benefits shall be paid for sickness or accident or death not covered by workmen's compensation, and these benefits must be provided for: Medical, surgical and nursing attendance; medicines and surgical supplies; cash benefits; funeral benefits. All necessary medical, surgical and nursing attendance and treatment shall be furnished from the first day of sickness during the continuance of sickness, but not to exceed 26 weeks of disability in any consecutive 12 months, including medical, surgical and obstetrical aid to insured women during confinement. The carriers of the insurance, *i. e.*, the society or association, subject to the approval of the commission, shall make organized provision for medical, surgical and nursing aid by duly qualified physicians, surgeons and nurses. Insured persons shall be supplied with all necessary medicines, surgical supplies, dressings, eye glasses, trusses, crutches and similar appliances prescribed by the physician or surgeon, in cost not to exceed \$50 a year. Hospital treatment shall be furnished if required.

The relation of the medical profession to the detailed working of such a measure remains to be planned, as we pointed out in our previous editorial. Of course the profession should be represented, but whether on the commission, or a special advisory board, or through local medical associations, remains to be seen. To say that the bill should guarantee a high standard of medical aid is self-evident. The matter needs further study. The progress of a similar health insurance bill in New York State is shown by a news item in another column.

PECULIAR SOURCES OF PLUMBISM.

WE are all familiar, of course, with the clinical picture of lead poisoning, or at least we have it near enough to the surface of consciousness to produce at a very short notice; but we seldom figure upon it in making differential diagnoses. Excepting always industrial workers

who handle this metal, we rarely run across this toxemia in ordinary practice, and such cases as we do find are so commonly due to a tainted water supply that a number of persons are affected at once, facilitating considerably the diagnosis. The fact should not be overlooked, however, that lead is a very common metal and apparently very easily absorbed by the system. In the *Lancet* for Oct. 2, 1915, Dr. Hall reports two interesting cases from his own practice. One of these was a factory hand whose work had nothing to do with lead and whose water supply was found to be innocent; it was finally discovered that he had been consuming large quantities of a soft drink which he bought at a store near his work. This drink was brought up from the cellar through a lead pipe, and being somewhat acid ate away the lead. On analysis it was found to have one grain of lead to the gallon.

The other case was much more unusual. The patient was diagnosed correctly, the water supply of his house was found to have a slight trace of lead, this was remedied and he passed from observation. About a year later he was sent to the writer with greatly aggravated symptoms, including some nervous ones. The patient himself had naturally given up the idea of plumbism as his condition was not ameliorated with the correction of his water supply. Dr. Hall assured him, however, that the diagnosis was absolutely positive and, after some search for the source of the trouble, it was found in the patient's vest pocket. He had been accustomed to keep in a certain pocket of every suit of clothes a quantity of small shot which he used on an air-gun against depredating cats. He had been accustomed to thrust his thumb and forefinger constantly in this pocket and finger the shot. On turning the pocket inside out a large quantity of fine dust was discovered which proved on analysis to be almost pure lead. A complete verification of this assigned cause was found in the improvement and final cure of the patient.

All this should teach us not to think in conventional lines. It is customary, if the possibility of lead poisoning occurs to us in examining a patient, to enquire into his occupation, and if he does not handle lead at all to dismiss the idea unless the picture becomes very plain. Even in that case the tendency is to examine the water supply and, if we find no lead there, conclude that it must be some obscure neurological

trouble. It seems probable that there may be other sources of plumbism as odd as the ones above and contributions of them to the literature would be valuable. Such a case report appears in the proceedings of the New York Neurological Institute on page 508 of this issue of the *JOURNAL*.



SMALLPOX AND ANTI-VACCINATION LEGISLATION.

THERE is at present pending before the Massachusetts General Court a proposed bill providing the repeal of the statute law requiring pupils and attendants of the public schools in this Commonwealth to be vaccinated, and permitting unvaccinated children to attend the public schools on written request of a parent or guardian, except in times of epidemic.

It is disappointing to chronicle the recrudescence of this piece of anti-vaccination legislation, which in effect would establish in this community the "conscientious objector" principle that has operated so injuriously in Great Britain. It is discouraging, also, that in spite of previous defeats of similar measures, and in spite of the unanimous adverse recommendation of the State Department of Health and of many physicians present both as individuals and as representatives of the Massachusetts Medical Society, this bill was, on March 23, ordered to a third reading by the House of Representatives on a roll-call vote of 127 to 105. It would seem that the arguments which have been so often adduced on this subject should not need annual repetition, yet it appears necessary to continue indefinitely the fight for intelligence over ignorance as the only means of safety.

In another column of this issue of the *JOURNAL*, we take the greatest pleasure in publishing an article on "The Truth about Smallpox and Vaccination," by Dr. George W. Gay of Boston, who has for years been a staunch defender of vaccination and has devoted a large share of his energy and time to the subject of medical legislation, acting in the interest of the medical profession and of the true public welfare. The arguments on the subject of vaccination and smallpox cannot be better presented than in his words; and we cannot do more than to direct the attention of our readers to them and to

trust that they may come also to the notice of, and may carry conviction to, some of those who are still misled upon the subject. The passage of the bill now pending before the Legislature would be a calamity for the community, and it is earnestly to be desired that this measure may be again defeated like others that have hitherto preceded it. All physicians having the welfare of the public genuinely at heart should take every step in their power to ensure its defeat.*

THE ALCOHOLIC IN COURT.

IN another column of this issue of the JOURNAL we publish an article by Dr. Anderson on the alcoholic in court, who presents a problem, the magnitude of which is hardly appreciated by the profession at large. In the Boston Municipal Court last year there were between thirty-eight and forty thousand arrests for drunkenness. The fact that a great many of these individuals were repeated offenders shows that they furnish a serious social problem, not to mention the needs of the individuals themselves from a medical standpoint.

Attention has already been called to this problem by Dr. Neff and others, but as yet it has not received sufficient legislative recognition. The Norfolk State Hospital is a small institution and the number of cases that can be handled there is relatively small; and, moreover, only the more promising patients are accepted. Chronic cases are sent to the State Farm and to the House of Correction for short periods and serve innumerable sentences. These unfortunates, after a brief period of restraint, are released unaffected into the community, only to return soon again to court and to detention and thus endlessly repeat the vicious circle. No purpose is served by their arrest, for neither are they made better nor is society adequately protected.

In his article Dr. Anderson has made a study of one hundred of these cases, selected at random, with the idea of determining what they are and what they need. This article was written with the intent of aiding a movement now taking shape for proposed legislation. The consideration of measures for the care and treatment of alcoholics is now in the hands of a legislative committee. The crux of the problem is the present lack of provision of hospital care for

the cases which must have it if their condition is to be altered. A great number of deteriorating and defective alcoholics also need prolonged attention for a matter of years rather than weeks. What is most to be desired is an extension of the hospital and colony plan so as to include those cases for whom prolonged detention is desirable. Punishment for such persons is futile; they are medical problems and should be treated as such.

MEDICAL NOTES.

INDUSTRIAL HEALTH INSURANCE.—Keen interest in health insurance was manifested by the medical profession at the hearing, in Albany, on the Mills Health Insurance Bill on March 14. At this hearing Dr. James Rooney, of the New York State Society, said that although the bill was opposed by its Council, he had been instructed to ask for a commission to study the subject. Moreover, he expressed the hope that there might be coöperation between the medical profession and legislators so that the bitter misunderstanding which occurred in England might be avoided.

Among other speakers, Dr. Samuel Kopetsky felt that the law ought to contain provisions which would guarantee a high standard of service and representation of the physicians, while Dr. Emil Altman, of the Eastern Medical Society, and Dr. Eden V. Delphey of the American Economic Alliance, urged that the patient should have a free choice of doctor. Dr. Alexander Lambert, chairman of the social insurance committee, appointed by the American Medical Association, said that this body "realized that the health of the individual is an absolute essential to his welfare in this country. . . . Any scheme which will promote health and increase his efficiency as a healthful person is of interest to the American Medical Association. In conclusion he urged that the legislators give this "more thorough consideration and go over it from one end to the other and bring forth a law which will be of the greatest benefit both to the physicians and to the people among whom they shall work."

UNITED STATES PUBLIC HEALTH SERVICE EXHIBIT.—The exhibit of the United States Public Health Service at the Panama-Pacific International Exposition, is described in detail in a recent publication, Supplement No. 27. The exhibit was prepared with the idea of presenting in a popular and comprehensive way, easily understood by the general public, the latest methods of preventing the common communicable diseases. Enlarged models of the various insect transmitters of disease, such as the fly, mosquito, flea, tick and louse, attracted great at-

* Since the above was in print the anti-vaccination bill has happily been defeated in the House of Representatives, which refused its engrossment by a vote of 129 to 105.

tention and were, as a rule, closely studied by the majority of visitors. Some of the features of especial interest to the medical profession included a series of glass models illustrating the stages in the life cycle of the *Plasmodium vivax* and models of plants with methods of chemical disinfection of water to prevent the transmission of disease, together with data regarding the cost of operation of such plants and the outfit required for collecting samples and making bacteriological analyses.

EUROPEAN WAR NOTES.

CHOLERA IN BELGRADE.—Report from Athens by way of London on March 16 states that Asiatic cholera has again become epidemic in Belgrade, Serbia, where 50 cases with 30 deaths are said to have occurred daily for some time past.

RETURN OF THIRD HARVARD SURGICAL UNIT.—The members of the Third Harvard Surgical Unit have recently returned safely to Boston after their service of six months at a British base hospital in France. Prior to their departure from that country a dinner was given them by the leading medical officers of the British Expeditionary Force. At this dinner addresses were made by Col. Sir Bertrand Dawson, Col. Sir Almuoth Wright and General Sawyer, director general of the medical services. Dr. David Cheever, chief of the retiring Harvard unit, responded in its behalf.

FRENCH RED CROSS.—Recent report from Paris states that the French Red Cross now has 66,449 nurses on active service in the field and in hospitals. Two other similar organizations in France, "Les Dames Françaises" and "Union des Femmes de France," have 4,400 nurses and over 700 hospitals. There are 288 Red Cross hospital buildings in Paris alone. Twenty-two Red Cross nurses during the war have died of wounds or disease, one has received the Cross of the Legion of Honor, and 123 have been awarded other crosses and medals.

AMERICAN UNIT AT BERLIN.—Report from Berlin, by way of London, states that on March 28, there arrived at Berlin an American Unit of four physicians who are to be attached to the United States Embassy and will devote themselves to the inspection of German prison camps. The members of this unit are Dr. D. J. McCarthy and Dr. Alonzo E. Taylor of the University of Pennsylvania, and Dr. S. W. Irwin and Dr. J. T. Webster of Johns Hopkins University.

AMERICAN WOMEN'S WAR HOSPITAL.—We recently have received from Dr. D. Pearce Penhallow of Boston, now serving as chief surgeon and administrative officer of the American Women's War Hospital at Paignton, South Devon, England, an analyzed report of the second thou-

sand cases treated at that institution, representing the discharges from the Hospital from April 3 to December 8, 1915. A similar summary of the first thousand cases was published in the issue of the JOURNAL for December 23, 1915.

Of the second thousand, 732 were surgical cases, of which 571 were traumatic and 161 non-traumatic. Of the traumatisms 547 were wounds and 24 were miscellaneous injuries, chiefly sprains. Of the wounds, 254 were infected, 2 with gas bacillus, none with tetanus. Sixty-six wounds contained foreign bodies, of which 54 were removed by operation. There were 160 fractures, 11 of the skull, 6 of the jaws, 7 of the trunk, 95 of the upper extremity and 41 of the lower extremity. Of other complications, nerve injuries occurred 13 times and synovitis 6 times. A total of 221 operations were performed, including 27 amputations. Of non-traumatic surgical conditions there were 25 herniæ, 18 frostbites, 15 cases of hemorrhoids, 14 of otitis. Of 280 medical conditions, 93 were infections, of which 43 were dysentery and 19 rheumatic fever. Of non-infectious conditions, there were 48 cases of debility and 28 of gas poisoning. Of the surgical cases 63.8% were cured and of the medical cases 63.4%. There were five deaths of patients, one each of strangulated hernia, cerebral abscess, cerebral laceration, secondary hemorrhage and nephritis. In general these figures run closely parallel to those of the first thousand cases, but it is to be noted that 72 cases were invalidated out of service in the second thousand as against 35 in the first. Of the admissions during the period covered, the majority were from Flanders and a few from the Dardanelles.

AN AMERICAN SURGEON IN FRANCE.—Report from Paris states that Dr. Joseph A. Blake of New York, formerly professor of surgery in the University of Columbia, has been appointed chief of the surgical center in the Department of the Seine and the Oise. This position places him in charge of six military hospitals. During the first year of the war Dr. Blake was chief surgeon of the American Ambulance Hospital at Neuilly.

WAR RELIEF FUNDS.—On April 1, the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	\$109,450.01
Allied Fund	70,880.40
French Wounded Fund ...	66,285.58
British Imperial Fund ...	51,172.86
French Orphanage Fund ..	36,784.54
Polish Fund	27,563.92
Surgical Dressings Fund ..	22,576.17
Italian Fund	16,540.70
P. S. D. Fund	7,111.45
Allies' Tobacco Fund	1,135.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 1, 1916, there were 245 deaths reported, with a rate of 16.80 per 1,000 population, as compared with 262 and a rate of 18.25 for the corresponding week last year. There were 35 deaths under one year as compared with 28 last year, and 71 deaths over sixty years of age against 81 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 45; scarlatina, 70; measles, 167; whooping cough, 44; typhoid fever, 4; tuberculosis, 44. Included in the above were the following cases of non-residents: Diphtheria, 9; scarlatina, 17; whooping cough, 2; tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 5; scarlatina, 3; whooping cough, 2; measles, 5; tuberculosis, 19. Included in the above were the following deaths of non-residents: Diphtheria, 1; scarlatina, 3; tuberculosis, 2.

ST. MONICA'S HOME.—The recently published report of Saint Monica's Home for sick colored women and children calls attention to the need of that modest and worthy institution for help in the completion of an extension to the Home begun some months ago. The report states that \$2,000 only is required to finish the necessary alterations, and asks that subscriptions may be received. The capacity of the Home will then be increased to fifteen beds which, with the twelve fresh air beds in use, will make a total of twenty-seven beds.

WOMEN MEMBERS OF HEALTH BOARDS.—The Massachusetts State Senate has recently passed to a third reading a bill permitting women to serve as members of local boards of health in this Commonwealth. The vote stood 16 to 15.

BOSTON CITY HOSPITAL.—A meeting in the interest of medico-social work at the Boston City Hospital is to be held in Vose House on Thursday, April 6, at 4 P.M. The principal speaker of the afternoon will be Dr. Alexander Lambert, for many years a director of the social service department of Bellevue Hospital, New York City.

MEASLES EPIDEMIC IN BROCKTON.—The Brockton Board of Health has reported over 500 cases of measles since the outbreak first occurred. A rule which holds force in a Montello school to the effect that pupils suffering from colds, who have not had measles, are not permitted to attend school, it is hoped may assist in preventing the further spread of the disease in that section.

SCARLET FEVER IN NORWOOD.—The number of cases of scarlet fever reported in Norwood has reached 21 and, in an effort to prevent the further spread of the disease, schools and churches have been closed and public meetings prohibited.

Correspondence.

A RARE DANGER OF ETHER ANESTHESIA.

PHILADELPHIA, PA., March 20, 1916.

Mr. Editor: In my Ether Day address on "The Dangers of Ether as an Anesthetic,"* I failed to note one rare, but important, danger, to which a correspondent has just called my attention. The reason why it did not occur to me was that I had never personally experienced, nor heard of, any trouble such as my correspondent describes. His personal case is as follows: He was operated upon at a large hospital by one of its best surgeons. The anesthetist, however, was a medical student of little experience and evidently more interested in the operation than in his duties as an anesthetist. He carelessly poured a quantity of ether into the patient's right eye. Unfortunately the patient was blind on the left side. Naturally he struggled. This was, again unfortunately, mistaken for resistance to the anesthetic and still more ether was forced upon him. The result was a "severe burn to the eye, with the formation of an ulcer, blindness for six weeks and glasses ever since."

My correspondent writes that he is cognizant of another similar case.

My own anesthetists almost always have been careful to avoid any such accident, and in addition to that have had a bowl of warm boric acid solution at their elbow. From time to time they have bathed the eyes so as to protect them even from the vapor of ether, and very often have put a pledget of absorbent cotton wet with the boric acid solution on the eyes, during the administration of the anesthetic.

Yours very truly,

W. W. KEEN, M.D.

COCCYGODYNIA AS A MANIFESTATION OF SYPHILIS.

BOSTON, MASS., March 21, 1916.

Mr. Editor: To suspect syphilis as a common cause of this painful complaint would be manifestly an exaggeration of the possibilities. At the same time it is wise to keep an open mind on the subject.

The occurrence of this symptom in obscure cases, which later I have proved to be unrecognized syphilis, has happened a sufficient number of times to make the matter more than a coincidence in my opinion. Unexplained "neurasthenia" has of late been proved to be unrecognized syphilis more than once. It has been found that patients suffering with pain in the back of the head and at the "base of the brain," seemingly typical neurasthenics, are really suffering from high vertebral syphilis.

The probable explanation of these cases of coccygodynia is similar; they have a definite pathologic process to account for their pain. The coccyx is a "bone of stress," similar to the tibia, and we are dealing with a true osteo-periostitis, often started up in these cases by a fall or blow, so often the history in specific bone troubles. Combined rectal and external palpation gives bone pain, which can be compared in every way with that of the pain of pressure over specific tibiae.

Very truly yours,

WILLIAM PEARCE COUES, M.D.

ERRATUM.

We regret exceedingly that, by an inadvertence in proof reading, the word "cows" was printed instead of "horses" in Dr. Walcott's article in the issue of the JOURNAL for March 9, 1916, (Page 338, column 2, line 14). The clause in question should read, therefore: "we were able to verify the diagnosis by means of one of the horses."

*On October 16, 1915. See BOSTON MEDICAL AND SURGICAL JOURNAL, December 2, 1915.

APPOINTMENT.

DR. JOSEPH J. O'BRIEN, of Dorchester, Mass., has been appointed medical inspector in the Boston public works department in succession to Dr. Arthur H. Davidson.

NOTICE.

PHILADELPHIA ACADEMY OF SURGERY. THE SAMUEL D. GROSS PRIZE OF FIFTEEN HUNDRED DOLLARS.—The conditions annexed by the testator are that the prize "shall be awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty printed pages, octavo, in length, illustrative of some subject in surgical pathology or surgical practice, founded upon original investigations, the candidates for the prize to be American citizens."

It is expressly stipulated that the competitor who receives the prize shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery, and that on the title page it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery.

The essays, which must be written by a single author in the English language, should be sent to the "Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College of Physicians, 19 S. 22nd St., Philadelphia," on or before January 1, 1920.

Each essay must be typewritten, distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay.

The Committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year.

The Committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

WILLIAM J. TAYLOR, M.D.,
JOHN H. JOPSON, M.D.,
EDWARD B. HODGE, M.D.,
Trustees.

SOCIETY NOTICES.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—Meeting for medical improvement at United States Hotel, Boston, Thursday, April 6, 1916, at 11.30 A.M.

Reader: Beth Vincent, M.D., of Boston.

Subject: "Transfusion and Splenectomy in the Treatment of Pernicious Anemia.

For F. A. Bartlett, M.D., of Norfolk Downs.

F. H. MERRIAM, M.D., *Secretary.*
South Braintree, Mass.

THE HARVEY SOCIETY.—The tenth lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, April 8, 1916, at 8.30, by Professor Stanley R. Benedict, Cornell University. Subject: "Uric Acid in Its Relations to Metabolism."

MASSACHUSETTS GENERAL HOSPITAL CLINICAL SOCIETY.—Meeting on Monday, April 10, at 7.30 P.M., Out-Patient Building amphitheatre.

1. Demonstration of Cases.

2. Medical Missions and Opportunities in China, Armenia and Other Parts of the World. Illustrated by lantern slides. Mr. Brewer Eddy.

Physicians, surgeons and students are cordially invited.
ELLIOTT C. CUTLER, M.D., *Secretary.*

THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.—The next meeting will be held at the Hotel Brunswick (Room G), at 5 P.M., Tuesday, April 11.

Dr. J. Baptist Blake, Surgeon, Boston City Hospital, Assistant Professor of Surgery, Harvard Medical School, will address the society on "Massage and Mobilization in the Treatment of Fractures."

Members of the medical profession are invited.

DOUGLAS GRAHAM, M.D., *President.*
Hotel Brunswick, Boston, Mass.
MRS. MABEL F. WALKER, *Secretary.*
115 Cedar Street, Malden, Mass.

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the Peter Bent Brigham Hospital on Tuesday evening, April 11, at 8.15 P.M.

PROGRAM.

1. Demonstration of Cases.

2. A Clinical Study of the Secretions of the Digestive tract. Dr. Thomas R. Brown of Baltimore.

Discussion by Drs. W. B. Cannon, E. P. Joslin, and J. H. Pratt.

Medical students and physicians are cordially invited. Telephone Brookline 5260.

Any visitors may be on telephone call if their names are left at the front office of the Hospital.

RECENT DEATHS.

DR. GRANVILLE PRIEST CONN, who died on March 24, at Wayne, Pennsylvania, was born in 1832. During the Civil War he served as assistant surgeon of the Twelfth Vermont Regiment. Later he settled in the practice of his profession at Concord, N. H., where in time he became a member of the State Railroad Commission and president of the New Hampshire Medical Society. He had published a history of New Hampshire surgeons in the Civil War.

DR. LEON LABBÉ, who has died recently at Paris, was born at Merieaut, France, in 1831. He graduated from the College of Argenta and the Lyceum of Caen and for many years practised his profession in Paris. He was a member of the French Institute and of the Academy of Medicine, honorary surgeon to the Paris hospitals, a former president of the Society of Surgery at Paris, a commander of the Legion of Honor, a senator and president of the Council. He was also commander of several foreign orders, and the author of many works on medical subjects.

DR. FRANK J. LUTZ, who died of cardiac disease on March 24, at St. Louis, was born in that city on May 24, 1855. After graduating from St. Louis University, he received the degree of M.D. from the St. Louis Medical College, and in 1876 settled in practice in his native city. He was professor of surgery in the medical department of the University of St. Louis and had served as surgeon-in-chief and consulting surgeon at various local hospitals. He was a member of the Missouri State Board of Health and for several years was surgeon general of the Missouri State Militia. He was a member of the American Medical Association, the American Surgical Association, the Missouri Medical Association, the St. Louis Surgical Society and the St. Louis Medical Society.

DR. EZRA ALLEN HOBBS, a retired Fellow of the Massachusetts Medical Society, died at his home in Framingham, March 26, aged 70 years. He was born in Berwick, Me., and was educated at the Medical School of Maine, taking his degree in 1869, and at Bellevue Hospital, New York. After practising in New York, Boston and Peabody, he settled in Framingham and was town physician for thirty years, and was a medical examiner. He leaves his wife and one son.

DR. HORACE P. BARTLETT, who died on March 29, at North Brookfield, Mass., was born in 1836 and had been a practitioner of dentistry in that town for nearly sixty years. He is survived by one daughter and two sons.

The Boston Medical and Surgical Journal

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Address.

PROGRESS OF NURSING.*

BY WILLIAM H. MERRILL, M.D., LAWRENCE, MASS.

It has been suggested to me to present a very brief sketch of the progress of nursing as exemplified in the establishment and development of training schools for women nurses. Limitation of knowledge and time compel me to note, with two exceptions, the events in our country only.

No attempt will be made to describe the conditions of the dark ages previous to the entrance of organized bodies of women into the field of nursing, except to say that a reading of the statements, official and lay, of those conditions shock and pain us; and to note the individuals, dates and localities which stand out in high lights by brilliant contrast with the darkness. The first of these beacons, the one of greatest brilliancy and longest duration, is the nursing by the women of the religious orders. This nursing must, from the very nature of the times, have been unscientific and, in a medical sense, untrained; but it possessed qualities which will always be of the highest importance,—sympathy, kindness and cleanliness. The history of this nursing is a glorious part of the history of the women of the church and of its priesthood. So far as I am informed, the work of nursing has always been promoted and fostered by religious orders, or prominent members of such bodies.

* An Address to the Graduating Class of the Lawrence General Hospital Training School, 1914.

In this country sporadic attempts, and some of them in a measure successful, were made, from a period just before the nineteenth century on, to establish places of training for women in nursing, especially in maternity cases. The first of which there is a record was in 1798, under Dr. Valentine Seaman at the New York Hospital. A notable one in Philadelphia, connected with the Philadelphia Dispensary, has records beginning in 1837, but it had been in existence much longer. This one endeavored with some success to extend its activities beyond maternity cases into general work, and to what is now known as district nursing. This latter branch was very successful and continued until the close of the century.

Judged by the standards of Florence Nightingale, these would not be considered real training schools, or at least, only in a most experimental stage. Contrasted with the ideas of teaching, discipline, and all details of administration as conceived by Nightingale, they certainly were crude. I have been informed by experts that Florence Nightingale's conception of the fundamentals of the training of nurses has not been exceeded in the intervening years, a rare conception to have remained the thread on which have been strung all the marvelous developments of the art for 54 years.

When Florence Nightingale's work in the Crimea was drawing to a close, her friends and admirers in England desired to provide a memorial for her. When approached on the subject Miss Nightingale said the most acceptable form it could take would be an endowment for a training school for women nurses. A meeting to

promote this memorial was held in London in 1859. Although the meeting was an enthusiastic one and attended by prominent people of the time, one of its noticeable features was the absence of equally prominent individuals, and especially statesmen, who had been invited.

A fund was subscribed and placed in Miss Nightingale's hands for administration, and in 1860 she was permitted to establish the first training school for nurses, as we know the term, in the world, in six wards of St. Thomas', the oldest hospital in England. The policy of this school was to train women, not for private work, but to become superintendents of other training schools. Well did it do its work, and so quickly did the new idea become popular that within ten years its graduates were scattered over England and Scotland at the head of training schools.

In 1861 a school for training maternity nurses was established at the Woman's Hospital in Philadelphia, and ten years later the Woman's Hospital of Chicago began more or less systematic training of women for such work. The time had now come and the competent women were at hand definitely to organize the movement in America.

In the fall of 1872 the New England Hospital for Women and Children in Boston offered a course of one year in practical nursing, supplemented by lectures and demonstrations. Six pupil nurses entered during the fall, the earliest of whom was Linda Richards, who, aside from being the first nurse to receive a diploma in America, was so gifted that she became the most notable figure in this country in the organization of training schools. To her little autobiography, which I urge you all to read, we are indebted for the most interesting account of earlier conditions, now available. The next spring, 1873, the Bellevue Hospital Training School for Nurses was organized and offered a two years' course.

Although I promised not to disturb you with a recital of the horrors of illness before nursing by women was established, I cannot refrain at this mention of Bellevue Hospital to quote the description given by Mrs. Joseph Hobson, secretary of the committee appointed by the New York State Charities Aid Association, of her first official visit to Bellevue Hospital. An account of what she saw may offer a reason why the Bellevue Hospital Training School for Nurses was the second one founded in America.

Mrs. Hobson wandered into one of the large double wards of the hospital; there was no one to ask what she wanted or who she was, and finally she found a young man busied about the patients, who proved to be a physician. Introducing herself, she said she would be grateful for a few hints as to what to look for. "You want to see things," said the young man, with an inexplicable expression. "Well, I can show them to you. Do not appear to be with me, but follow me around." Mrs. Hobson followed him, and watched as he lifted the bed-clothes from a

newly arrived case and proceeded himself to give to the patient—a woman—some attempt at a bed bath.

This young man was Dr. Gill Wylie, who later became one of New York's most eminent surgeons. Dr. Wylie then conducted Mrs. Hobson to the bath room and pointed out the litter of dirty rags on the floor, where the "nurse" (a ten-day prisoner from the Island) had her bed. The dinners came to the wards, and fish and potatoes were dumped, without dishes or knives, on the bare boards of long tables. In the laundry was one lone old decrepit man, its only force, and he had had no soap to use for six weeks, because the appropriation had given out.

This hospital was probably the worst in the country, but there were other municipal hospitals and almshouses combined where conditions were but little better. Great as has been the relief of the wealthy members of our communities by the development of a supply of trained nurses, it is immeasurably surpassed by the comfort and life-saving service to the needy. Linda Richards upon her graduation in the fall of 1873, came to Bellevue as its first night superintendent.

A few months after Bellevue, the Massachusetts General Hospital Training School for Nurses was organized, to be reorganized a year later by Miss Richards. The reason for its reorganization will be glimpsed in a recital of conditions by Miss Richards later, when speaking of the teaching and work of individual pupil nurses. In this year the Training School of the Hartford Hospital, at Hartford, Conn., was founded; in 1875, the New York City Training School at Blackwell's Island; in 1876, the Pennsylvania Hospital Training School at Philadelphia; in 1877, the New York Hospital Training School, New York City; and the same year the Buffalo General Hospital Training School, Buffalo, N. Y.

The founding of the Boston City Hospital Training School in 1878 marked a new epoch in training school administration. Up to this time the training schools had not been an integral part of the hospital, but were conducted by an outside body of women, who were given authority to conduct the training in the wards of the hospital. Such an arrangement led to divided authority, friction and inefficiency. Dr. Cowles, the superintendent, was alert to this defect, and when the trustees gave permission to establish the school at the Boston Hospital, Miss Richards was called from the Massachusetts General to organize a school which should be an integral part of the hospital. This departure has been an unqualified success. There is but one training school of importance in the country now not so organized.

The movement was now spreading so rapidly that an enumeration of the schools founded in the immediately ensuing years is hardly possible, and cease to be interesting except to note this rapid growth and to speak of those which

are of interest to a particular community. It is my information that the Salem Hospital Training School was the first in Essex County, organized in 1880.

We are naturally much interested in the development of our local training school, and will glance at its history. Founded in 1882, only four years after the Boston City, and along the lines of that school, its standard has been high, its work efficient, and its growth rapid. Interesting details of its organization by the devoted and far-seeing individuals who promoted it, are found in the annual reports of its then president, Mrs. George W. Sargent, in 1887, and in an admirable address by Dr. George B. Sargent, delivered at the graduating exercises of the class of 1906. To these sources I am indebted for most of the following figures.

The entering class of 1882 was six in number; in 1896 there were ten pupil nurses. The number had increased in 1904 to twenty, and there are now forty-two pupil nurses and six graduate nurses connected with the school. This number will necessarily be increased to fifty upon the completion of the children's ward, now under construction. One hundred and seventy-six women have received diplomas. These 176 were the survivors who met the various elimination tests, out of a total of 600.

While compiling this very brief, and in many important details incomplete, résumé of the development of these organizations to provide nursing for the sick, two things have much impressed me: The rapidity of its development,—all within the professional life of men now actively engaged in the practice of medicine; and the preponderating influence of women in its organization and promotion. Carlyle said, "History is the biography of great men." The history of nursing is the biography of great women.

We will now glance a moment at the development in the training the individual pupil nurse receives. And again we take a glimpse of the conditions in the pre-training school days through the eyes of a woman,—Miss Richards. About 1868 Miss Richards entered the Boston City Hospital, in the capacity of what received the name of nurse, but which she says was that of the ward maid of today. She scrubbed the floors, washed the dishes, and very occasionally the patients. The matron of the ward gave the medicine as per orders from bottles which had numbers, not names, of medicines on them, and of whose contents she had no knowledge.

When Miss Richards was night superintendent at Bellevue, which had 200 or more patients, the gas and heat were turned off at midnight. Two candles per week were provided the nurse of a ward with which to locate a patient after midnight, and if she used more she had to pay for them. No records were kept until the next year; all information given by one nurse to another or to a doctor was verbal.

When Miss Richards began the reorganization of the Massachusetts General Hospital Training School the following routine for the nurses was in vogue. A nurse would begin the day washing used poultice cloths and bandages, and it would be afternoon before the task was finished; then she would go off duty. The second day this nurse helped in the dining-room and washed dishes. On the third day she went to the wards, washed the patients' faces, swept floors, and made beds. The fourth day she would act as head nurse. The fifth day she served as general utility nurse, but at nine went off duty to sleep, so as to be ready to go on duty that night. The sixth day she had to herself. This last arrangement, which gave the nurse a rest one day in six, was the only feature of the system not wholly bad. On the seventh day she again washed poultice cloths and bandages. No wonder a member of the staff said they "knew nothing. Put the school out; we do not want it; our old way was better."

The esteem of the staff of every hospital is abundant evidence that the methods and training in the schools have changed. A nurse now arrives at the distinction of being in charge of a ward only when well along in her third year, probably rarely before the beginning of the third year.

Members of the Graduating Class, while a few, upon whose head the frost is gathering, sigh for "the good old days," I assure you most of those privileged to have lived in a number of decades believe this to be the best one of all in the world's history. The brief sketch of the earlier methods of training and its gradual change to the methods and standards of the present assures you that at no previous time would you have received so high a training with so small an amount of physical laborious work, great as this has been, as now. You are also entering the practice of your profession at a time when the idea of individual service direct from one human being to another is more than ever the ideal of civilization.

Your training and the character of the service you are to render the community are in harmony with this ideal. The opportunity of realizing in your lives this ideal of service is greater than that of the members of any other profession, not excepting the clergy or the medical. Some consciousness of this opportunity for service must have led you to begin the training, and we know that by precept and example it has been called to your attention for three years. This is not said to incite you to grasp this opportunity, for I believe you will do so, unconscious perhaps of any special effort to attain an ideal, but simply as a part of "The Day's Work." During these years you have also been incited to attain to the highest plane of the ethics of your profession by those most competent to do so; these were and are your true friends, and with your consent would be your guides.

At one time I might have suggested to you the deliberate offering of your services without pay at times to charitable institutions or in private cases. A fuller comprehension of your exhausting duties inclines me to the belief that only in exceptional cases and by those endowed with more than the usual endurance is this advisable, or your duty. To render to the patients in your care painstaking service it is necessary that you should be in good health and not overtired. The usual paid work required of you who will depend upon your own work for a livelihood, will demand your strength well up to these limitations.

Now I would call your attention to a fast widening field, in which those of special aptitude, ambition and willingness to pay the price of time and study may render signal social service. I refer to the rapid utilization of the services of trained nurses in such official and semi-philanthropic work as school nurses, nurses for insurance companies, industrial companies, milk stations, etc. You may ask how this can be an avenue for special social service, when nurses are paid for their work. The reply is that the pay is all or more than a poorly trained, or an ambitionless nurse is worth; but it is much less than the value of an intelligent, well-trained, devoted, resourceful woman, who is ambitious always to render more service than she is paid for. The possibilities in this work are almost limitless and the demand for a high type of nurse insistent. The kind of woman desired is illustrated in a circular received by the head of your school from the city of Philadelphia announcing an examination for nurses. The total of ten points making the examination is divided as follows: four for training and experience, three for personality and judgment, and three for technical knowledge of nursing. This will illustrate that this work demands the technically well-trained nurse, as understood in the past, plus social and executive capacity and experience in broader fields.

Opportunities are opening where those fired with a desire for this larger service and of such capacity can obtain the experience if they are willing to give time. To this field I would direct only those who are willing to pay the price, and not be time-servers, simply "holding a job." During the three years of training, your exacting duties and conformity to necessary discipline has limited your social privileges; the duties of your profession, its hard, long-continued hours of work and irregular hours of leisure will continue this limitation.

The development of your profession has brought within each community a body of intelligent young women as capable of social enjoyment as any of its members. Most of these women are a long distance from their homes and are largely dependent upon the members of that community for the good fellowship so necessary to the normal life. I bespeak for you a

continuance of the kindly interest which I know you have experienced from those with whom you have come in contact; and also a more general and careful consideration of your special social problems, which arise from the tendency to isolation, produced by the character of your work. A consideration on your part of the means at hand will show you many open doors to the social life of the community, where you will be heartily welcomed. All the church societies and the Young Women's Christian Association welcome you.

Again, there is an important avenue to a semi-social, semi-professional life of which you are strongly urged to avail yourselves. I refer to the fellowship of your state, county and alumni organizations of nurses. It is your privilege and duty to become members of these organizations as soon as you are eligible. From other members you will receive information, stimulation to better work, and be in a position to aid in the general advancement of your profession. No nurse can live to herself alone, and every successful performance of duty adds to the honor of you all, as does every failure detract from the honor of all. Those who have watched your work in the past believe you will discharge those duties creditably in the future.

Original Articles.

CONFERENCE OF MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.

I.

WHAT SHALL BE THE ATTITUDE OF THE PUBLIC TOWARD THE RECOVERED INSANE PATIENT?*

By H. C. SOLOMON, M.D., BOSTON.

Assistant in Neuropathology, Harvard Medical School; Investigator of Brain Syphilis for Massachusetts State Board of Insanity; recently Assistant Physician, Psychopathic Hospital, Boston.

DR. CHARLES W. PAGE, in an address before the State Board of Insanity Conference at the State House in 1904, said: "While a certain portion of the human family must have suffered from mental disorders for ages past, it is only about 100 years since the propriety of controlling insane persons by the aid of manacles, shackles, ropes, straps, etc., was especially called into question. At this stage of the world's progress, it is difficult for one to comprehend those former-day doctrines of philosophy, religion and ethics which overpowered or distorted human sensibilities to such a degree that compassion for the afflicted insane had little, if any, weight in deciding what measures should be employed

* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 18, 1915.

in their treatment; while a vague, mysterious horror, or fear of the disease, readily suggested to friends or custodians, barbarous antagonism to its manifestations."

If such was the attitude of the trained attendants of the insane and the students of insanity so short a time since, it should not seem strange that the general public, the layman, still has some of this "vague, mysterious horror, or fear of the disease." That this feeling is fairly general needs no emphasis to this audience, I am sure. The reason for this is a misconception of the meaning of insanity, associated with the prejudice of the ages. In the minds of many, insanity means a wild, maniacal state. To them insanity is synonymous with "madman." This, of course, is not true. The majority of the insane, on the contrary, are quiet and apathetic. We frequently have difficulty in convincing relatives and friends that a patient is really mentally diseased, and many are the exclamations of surprise because patients often show nothing that seems abnormal. Recently I have had medical students come to me after examining a patient and state that the patient was not insane, for he was not different from certain persons seen outside of the hospital. The reply is that those referred to outside the hospital may have been insane, for mental disease does not necessarily mean that intramural care is required. There are many persons in the community suffering from a more serious form of mental disease and further advanced than patients in our institutions. Many of the so-called eccentric and peculiar individuals are, in fact, suffering from mental disease. Then "nervous prostration," "nervous breakdown" or "mental breakdown" means in very many instances that the patient is going through an attack which the psychiatrists would call an attack of insanity. As long as the condition is called by any of these names the person is safe, but as soon as his associates are convinced that this condition is one of insanity, a morbid and hysterical fear wells up and the person is an object of suspicion to be avoided.

"But it is not of the insane patients that I wish to speak. It is rather about the patient who has recovered from an attack of insanity—recovered so entirely that he shows no signs of his previous illness and has regained his former efficiency as an individual and as a member of society.

There are many forms of insanity, and in some of these forms the outlook for recovery from the attack is good. The most important group from this standpoint is the group suffering from manic-depressive insanity. The characteristic feature of this form of insanity is that the patient, after an attack of mania or depression, or a combination of these two states, recovers completely. It is from this form of disease that a large portion of the discharged patients are drawn. Of 1348 discharges from the state hospitals of this Commonwealth in 1914, 286, or

21%, were victims of this form of disease. A somewhat smaller percentage of recoveries, 12.7%, belong to the group of alcoholic psychoses. Others are discharged during the year who have not completely recovered, but who still have vestiges of their former trouble, or who are somewhat deteriorated. We shall not consider this group, however.

When a patient leaves the hospital as recovered he is no longer insane, he is no longer ill. He has been able for quite a period to get on well in the protective environment offered by the institution. He now comes out into the more complicated environment offered by the community. He must again take his place as a member of society. Usually he must make his living. He must mingle with others. On the reception that he meets much depends.

Just as a mistaken idea of the meaning of insanity pervades the minds of so many, so is there an ignorance of what to expect of the recovered patient. This lack of knowledge leads to a fear such as a timid child feels towards the unknown dark. If fear is not palpably expressed, a suspicious attitude is likely. One avoids being alone with this person of unknown potentialities. Perhaps he will have an outbreak. Perhaps if he is given matters of importance to attend to, his judgment will prove faulty.

If we will only bear in mind that many so-called cases of nervous prostration,—cases that all are familiar with and none fear,—are in reality cases of manic-depressive insanity, it will be easier to realize that the recovered patient recovers to such a degree that he shows no symptoms, no peculiarities, nothing that should allow suspicion to rest upon him. He is entirely fit to return to any form of enterprise of which he was previously capable, for one of the essential characteristics of this disease is that there is no deterioration.

The unfortunate reaction of the public toward the recovered insane patient affects him in three relations: (1) individually, (2) socially, and (3) as a member of the body politic. He finds that it is difficult for him to obtain employment. I have asked many of my lay friends what their attitude would be toward employing an individual who had been discharged from an insane hospital, and almost invariably a hesitancy, if not an absolute refusal, was the reply. Many explanations were offered, based in large part on a feeling of fear. A few people wisely stated that they would want the advice of the psychiatrist who had charge of the patient, and felt that they would act on his advice. This reaction I cannot commend too highly. There are a few who are only too glad to give employment to these patients, but they may be classed with the philanthropists who are willing and anxious to give employment to discharged convicts. The majority are afraid; afraid of what—they do not know.

And as the patient meets difficulties in obtaining employment, so, too often, does he meet

difficulties in communion with his fellowman. He is conscious of the feeling of suspicion on the part of his family and friends. He realizes that he is being continually watched, and that continually it is expected that he will do something. The fact that he has been insane is frequently thrown up in the heat of argument. Finally his expressions of opinion are met too frequently with a frank skepticism, as coming from an unstable mind.

The effect on the recipient is readily imagined. As a rule, after recovering from an illness an individual finds himself reduced financially and in urgent need of work. If this is not forthcoming it provides justifiable cause for worry, and worry is to be avoided. Then, as work has been shown to have a therapeutic value for the insane, even more so is it important to keep the recovered patient busy and occupied, so that he may have no cause to brood.

The story of "A Man Without a Country" may be used to illustrate what must be the effect of a somewhat similar attitude of society to the recovered insane. One need not be a fervent believer in psychogenesis, or an ardent advocate of the effect of an unfavorable environment in the production of mental disease or the precipitation of an attack to see that this condition must result deleteriously to the patient.

I have said that these recovered patients retain their former characteristics and abilities. They are as they were before the attack. This is true, but it is likewise true that these patients are subject to, and likely to have, recurrences. The prognosis given in manic-depressive insanity is that the patient will recover from the attack, but that he will be likely to have other attacks. This period of recovery is called a remission. A remission may be of a few hours' duration or of many years, and in some instances, there may be no recurrence. There are certain generalities as to the probable frequency of attacks and length of remissions that the psychiatrist can offer. The attack rarely, if ever, comes on suddenly, without warning. There are danger signals, such as insomnia, loss of appetite and loss of interest, unrest, etc., which are significant to the specialist. It is here that the psychiatrist and the institution are called upon to play their part in relation to patient and community. It is possible in nearly every case to forecast an attack, if the patient is kept under observation by a specialist.

It is the routine of most state hospitals that when a patient is discharged he is discharged to the out-patient department, where he is expected to pay visits at least once a month, in order that his condition may be observed. His friends and employers are informed that the hospital stands back of the patient, and if they have any doubts they have merely to communicate with the physicians of the hospital. Under such circumstances unpleasant difficulties rarely arise, and it is significant that damage to prop-

erty and person has practically never occurred through a patient discharged from a hospital and protected by the after-care department.

We may state from experience, then, that there is really no cause for fear. An objection offered to employing such a discharged patient is that he is likely to have a recurrence, and thus cause inconvenience by vacating his position. It is true that a recurrence is to be expected, but if we consider the average length of remissions and the average time that various positions are held, I believe it will be found that this objection is not very important.

I think it may be rightly said that the attitude of suspicion, fear and avoidance toward the discharged recovered patient is unjustifiable. It is not only unkind and unfair, but it has an injurious effect on the individual, and it is opposed to the higher doctrines of humanity and to the spirit of mental hygiene. Especially does it conflict with the efforts of the mental hygienist, in that the stigma which the term insanity, and all things related thereto, bears keeps many from visiting a mental clinic. Thus, aid, expert advice and treatment at the logical time, that is, early in the disease, is not obtained. It further tends to keep recovered patients from reporting for fear that it will become known that visits are being made to an institution for the insane.

The attitude that is advocated for the public is open-mindedness and reasonable desire to obtain reliable information when in doubt. A person discharged as recovered should be accepted as any other member of society—on his face value. But just as one may believe in a man's honesty by his appearance, before giving him credit his record is looked up; so should one do the same before crediting the recovered patient. And as such agencies as Bradstreet's and Dun's are established to furnish this information concerning one's financial credit, so the hospital or psychiatrist is prepared to give expert advice as to the patient's mental credit. And the hospital physicians are only too anxious to be helpful in this regard, for they realize that prejudice will then be superseded by knowledge. There should be a close coöperation between the hospitals and the public, for the hospitals are maintained by the public for the public, and not alone for those confined, but also for the discharged patient, and the patient's friend and employer. With this reliance of the public on the hospital, the patient will learn that the hospital offers him a great service after release. This will bring him closer to it, and will help in warding off the danger of a second attack of illness.

In Germany agencies have been established to help the discharged patients, called "Irrenhilfvereins." These are organized to help the patient outside the hospital, to educate him, his family and friends, and to aid him in obtaining work. In this country this work is being accomplished by the after-care departments of

the hospitals through the medical social service staffs. These efforts do much to bring about the necessary intercourse of institution, patient and public.

The attitude, then, that is desired is that of fair play; that the public seek information from the experts as the occasion arises rather than avoid the problems by drawing back. This attitude of dependence upon those of experience will, likewise, lead to avoidance of mistakes in the other direction, as, for instance, marriage with a recovered victim of insanity, which is contrary to the basic principles of eugenics. It will avoid the overlooking of symptoms of importance, whereby the patient suffers from the charitable interpretation of his associates.

Titchener has said that the common-sense view of today was a scientific hypothesis of yesterday; and the present slowly developed attitude of those familiar with the treatment and handling of the insane will, no doubt, become the attitude of the public in the future, just as has happened with tuberculosis and typhoid fever.

II.

THE RELATION OF SYPHILIS TO MENTAL DISEASE.*

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OF the causes operating to produce mental disease, there is one which in most discussions in the lay press or in public meetings is either entirely avoided or vaguely suggested under the name of "blood poisoning" or a "blood disease." This is the venereal disease—syphilis,—and not only is its connection to the production of insanity one of the most direct and well-established, but it is also a factor of no mean numerical importance, as shown by the fact that about one-tenth of all cases of insanity can be attributed to it.

Before considering the relation of syphilis to insanity, let us look for a moment at the disease itself. Syphilis is not a disease of recent origin, or even of recent recognition. Over 200 years before the Christian era the Chinese Emperor Hoang-ty caused a collection to be made of Chinese documents bearing on medical subjects, and in the translation of that series we find descriptions which establish without much question the fact that syphilis existed among the Chinese at that time. Not only are the descriptions of the first two stages of the disease apt, but the connection between them was recognized, and the use of mercury was advised as treatment,—a remedy which until very recently was the chief one, and that even now is considered as a valuable adjunct to the newer methods. Hebraic, Greek and Roman writings also refer to diseases

which were probably of the venereal type, and it is probable that some of the descriptions of leprosy in those writings refer to syphilis. Although the word leprosy still carries to the lay mind considerable fear, the physician of today knows it as a disease of relatively low contagiousness, which would scarcely have aroused the fear of infection or stimulated the rigid rules of isolation so patent in the writings referred to, while syphilis might easily have filled these requirements.

Shortly after the return of Columbus and his sailors from their first trip to America, Spain and Italy were visited by a scourge of syphilis which occurred at the time of a military expedition led by Charles the Eighth of France against Naples, and the scattering of the troops on their return from this expedition disseminated the disease widely throughout eastern Europe. This epidemic, called the Neapolitan outbreak, was characterized by marked contagiousness, great severity of symptoms, and a relatively high mortality, and these considerations have led many syphilographers to conclude that the disease was new in Europe, and had been brought from America by the sailors of Columbus' expedition. That the disease probably existed on this side of the Atlantic before 1492, is suggested by the findings reported by a number of observers on the traces of disease in bones of pre-Columbian source. The writer had the opportunity some years ago, while a member of an exploration party of the Ohio State Archeological and Historical Society, to obtain some diseased bones from the burial plots of the mound builders of the Ohio Valley, which undoubtedly antedate Columbus, and while their great age and partial disintegration precluded a positive diagnosis, the changes were such as to be entirely consistent with the results of syphilitic bone disease, and hardly to be expected from other bone diseases with which we are familiar today. Similar findings have been reported from Europe, however, in skeletons which are also undoubtedly pre-Columbian, and this fact, together with the documentary evidence already mentioned, seems to give evidence that the disease was present on both sides of the Atlantic before the voyage of discovery. The transplantation of a new strain of the virus of American origin into Europe might account for the severity of the Neapolitan outbreak, even if syphilis had been present in Europe for a long period. This variation in the potency of strains of the same disease transplanted to new localities, is recognized in other infectious diseases.

Syphilis has been comparatively slow in yielding its secrets to the modern investigator, and it is only within recent years that the causative organism has been known. Schaudinn reported the finding of the germ in 1905, and two years later Wassermann perfected a test by which we can recognize the presence of syphilis in an individual, whether or not there are any outward signs or symptoms, and these two discoveries

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have led to the accumulation of many important facts concerning the disease.

The germ is a very minute spiral form—the *Treponema pallidum*—which belongs to a group of organisms slightly higher in the scale of life than the bacteria. Seen under the higher powers of the microscope, it has 10 to 12 spiral twists in its length, not unlike a corkscrew. It can be grown outside the body, as demonstrated by Dr. Noguchi of the Rockefeller Institute for Medical Research, but only with considerable difficulty, and not on substances usually employed for cultivating bacteria, and stains not at all or only very faintly with the ordinary dyes used for microscopic preparations. The Wassermann test is a biochemical reaction carried out on the blood serum of a patient by means of sera prepared in experimental animals, and while it falls far short of that absolutism which the layman, and even many professional men, is wont to accord to a laboratory measure, yet it has proven one of the most potent and dependable diagnostic measures at our command today. The test is rather an intricate one, but perhaps I can give you some idea of its mechanization. When the red blood corpuscles of one animal, a sheep, for instance, are injected into another, such as the rabbit, the rabbit's blood serum gradually acquires the power of dissolving sheep's corpuscles when mixed with them in a test tube. This power is lost, however, if the rabbit's blood be heated to a certain temperature, but may be replaced by the addition of a little unheated serum from another animal, usually the guinea-pig. This substance which is lost we technically call complement, and it may be likened to the coupling pin, which connects an engine with the first car of the train it is drawing. This "coupling pin" is destroyed by heating, but a new one may be procured by the addition of fresh serum, and solution or lack of solution of the sheep's corpuscles when mixed with the heated rabbit's serum, tells whether or not it is present. This complement can be used up, however, by other combinations than the rabbit's serum, and the sheep's corpuscles. The blood serum of a syphilitic patient contains a substance which uses complement to combine with substances which can be extracted from syphilitic organs. Thus we have here two trains, *i.e.* rabbit's serum and sheep's corpuscles as one, and serum from the patient and extract of syphilitic liver as the other, with only one coupling pin, the fresh serum from the guinea-pig, which is added in making the test. If the patient has syphilis, the active substance in his blood uses up the complement and none is left to aid the rabbit's serum in dissolving the sheep's corpuscles. If, however, the patient does not have syphilis, the complement is not used, and shows itself by aiding the solution.

The disease itself is generally separated for description into the two types of acquired and hereditary. In both forms the severity of the symptoms varies greatly in different cases, and

may be so slight that little attention is paid them. In the majority of cases of acquired syphilis, however, the refractory local sore of the primary stage, and the general skin eruption, sore throat and falling hair of the secondary stage, are marked enough so that they are not apt to be overlooked. Following the secondary stage, however, there is almost always a period of apparent cure, when there are no outward signs nor symptoms of the disease, and it is, to all outward appearances, completely cured. It has long been known, however, that this was only an apparent cure, and that later the disease might show itself by a renewed attack on almost any part of the body. In some few cases of very severe infection, even when carefully treated, the disease is of a more or less progressive type, but characteristically, in treated or untreated cases, there follows, after the secondary eruption has disappeared, this dormant or latent period, bringing with it a false sense of security and a belief that a cure has taken place. Until the advent of the Wassermann reaction, the greatest uncertainty surrounded the question of cure, and frequently in cases which had been considered as cured, the disease reappeared, often after a period of years, as the late or so-called, tertiary stage. The Wassermann reaction has, however, gone far toward eradicating this uncertainty, and we now are able to determine whether the disease is still present in its latent form, and is, hence, a potent source of danger to the individual, or whether a cure has probably been accomplished. The data which are accumulating show very clearly that in a large proportion of cases, the disappearance of symptoms after the secondary stage is not to be considered as evidence of cure, and that unless treatment is continued conscientiously there is still the possibility, if not even the probability, of a later reappearance. One case has been recorded in which the Wassermann reaction was found consistently positive thirty years after the original infection. The hereditary type is that which occurs in the children of syphilitic parents, and its manifestations cover a rather wide range, dependent on the stage and severity of the infection in the parents. When the disease has been recently acquired and is in an active stage in the parents, the children are apt to be born dead or to die soon after birth, or if they survive may carry marked physical deformities through life. In other instances the disease makes its appearance during the early weeks of the child's life, or, apparently, it may here also lie dormant for years, as in the acquired variety. Let me again emphasize this tendency of the disease to remain alive and potent in the body without showing outward signs. Syphilis shows this tendency as well as, if not better than, any other disease we know, and while it is probably true that in this stage the danger of spread of the contagion to others is relatively slight, yet the individual is harboring a source of danger to himself, which can in the majority of cases, at least, be removed by conscientious

treatment accurately controlled by the Wassermann reaction.

The chief source of infection with syphilis is immorality, and this is the reason, of course, that its discussion outside of medical circles has been so curtailed. There are, however, other channels of infection which must be considered. The germs of syphilis do not live long outside the body, but in active cases of the disease, especially in the secondary stage, they are given off in enormous numbers by the moist surfaces of the body, such as the mouth, nose, throat, etc., and personal contact with such a case is, of course, not necessary, for contagion, as the germs may be readily carried from one person to another by such means as the common drinking cup, the public towel, or insufficiently cleaned soda water glasses, etc. Physicians, surgeons, dentists and nurses are also in some danger of infection through unavoidable contact with syphilitic patients. One epidemic of seven or eight cases in Philadelphia has been traced to kissing games. In crowded tenement sections the lack of personal hygiene often results in spread of the disease, and it is said that in parts of Russia where one bowl and spoon are used in common by the whole family, that once one member contracts the disease the rest of the family is practically certain to become infected.

When we come to consider the types of insanity directly caused by syphilis, we find that there are three fairly distinct classes: 1. General paresis; 2, cerebrospinal syphilis; and 3, syphilitic endarteritis of the cerebral vessels.

General paresis or general paralysis of the insane is now considered as a direct result of syphilitic infection. On looking back over the history of general paresis for the past twenty years we find that there has been a great controversy as to whether or not all cases, or even any cases, of general paresis could be considered as due to syphilis. The reason for this discussion lies, first, in the fact that the changes found in the brain are of a little different type than those produced by other stages of the disease and, second, that the symptoms of general paralysis do not, as a rule, develop until five to fifteen years after the syphilitic infection and that generally this period is free from other obvious symptoms of the disease. It is not strange then that many writers formerly questioned the rôle played by syphilis in the causation of general paralysis. The Wassermann reaction is positive in the blood of cases of general paralysis, however, in from 95 to 100% of cases, and not only this, but it is also found positive in an equally great percentage of cases in the cerebrospinal fluid. These results are striking, and yet we know that the Wassermann reaction is positive in leprosy, and may be so in scarlet fever and a small number of other diseases, so that on the data of this reaction alone it could not be definitely stated that we were not dealing with some other disease which gave rise to a positive result. Conclusive evidence was, however, forthcoming in 1913, by

the work of Moore and Noguchi, who were able to demonstrate the *treponema pallidum*—the causative organism of syphilis—in stained microscopic preparations of the brains of general paralysis cases in 24% of their series. This observation has been substantiated by many observers both here and abroad, and while it has not proved possible as yet to find the *treponemata* in every case, yet when we consider the technical difficulties to be overcome, I think we cannot avoid the conclusion that general paralysis must be considered as simply another form of expression of syphilis.

In the typical cases of general paralysis following from five to fifteen years after the syphilitic infection, come minor losses of judgment, frequently in business, little eccentricities, slight changes in personal habits and changes in relation to friends or the environment and, with these, various signs of alteration in the nervous control of the muscles, which can be easily determined on examination. Gradually these symptoms become aggravated, and delusions of great personal wealth or power, and a sense of great bodily well-being develop, followed by a marked loss in judgment, memory and general intelligence, resulting in a stage of deep dementia, where the patient is unable to care for himself and becomes a helpless bed-ridden charge on those into whose care he has been given. In many cases remissions occur which look to the casual observer like complete cures, but neurological and serological examinations will reveal residual symptoms, and later the disease will reappear, and probably every case ultimately goes down hill, and while the length of life after the onset varies greatly, the majority die within from two to five years after the first mental symptoms appear. It has been noted that there is a great variation in the proportion of cases of this disease found in various hospitals. This is probably accounted for in part at least by the type of population from which they draw. The writer has analyzed the admissions for ten years to one of the state hospitals in Massachusetts, including over 4700 cases of insanity, and found 9.5%, or something over 450 cases, were diagnosed as general paralysis. That this figure is fairly accurate may be seen by the fact that it corresponds fairly closely with the percentage found in all the State Hospitals in New York for one year.

Cerebrospinal syphilis, the second type of mental disease, is numerically of less importance. In it the disease attacks localized areas of the coverings of the brain or the supportive tissues surrounding the blood vessels, and often gives more symptoms of a physical than mental type, such as paralysis of special muscle groups, blindness, deafness, etc.

Cerebral syphilitic endarteritis is an inflammation of the lining of the blood vessels carrying blood to the brain, resulting in partial or complete blocking of their channels and consequent partial or complete starvation of

the parts of the brain involved. Let me quote the facts of a case of this type here: A young man born of American parents passed through the Brookline schools, and at the age of seventeen started into business. By the time he was twenty-one he was assistant business manager of the firm where he was employed and was doing very well. He left this position to enlist in the army at the time of the Spanish War and came back infected with syphilis. A year and a half later he had a paralytic stroke, and at about the same time his associates in business noticed slight errors in judgment and slight lapses in memory. Following the stroke, and in spite of active treatment, symptom after symptom, pointing to disease of the brain appeared, marked loss of memory, difficulty in speaking, loss of vision in one side of each eye, etc., and in two years he was brought to a state hospital, where he lived for six years as a helpless, hopeless wreck, with no sign of mentality left. He could not repeat his name and recognized it only part of the time. He had to be fed and dressed and cared for like a baby. An autopsy showed that several large vessels feeding certain parts of the brain had become plugged by the syphilitic inflammation and the brain substance of these parts had disappeared.

Aside from these three frank types of insanity caused by syphilis, there are probably many other diseases, both of physical and mental nature, which are caused by or influenced for the worse by syphilis, of which we are gradually gaining evidence, but which cannot yet be definitely outlined. We know that a great variety of physical deformities and some mental defects can be directly traced to hereditary syphilis, and it is possible that other types of imbecility and feeble-mindedness may be dependent on this condition, either directly, or by reason of its general effect on the body during the developmental period, and that in the acquired form also it may play a greater rôle than we yet realize as a contributing factor in persons predisposed to mental disease.

As in other diseases, two lines of combating the evil lie open to us—treatment and prevention.

Within the last few years a new remedy has been given to us by the late Professor Ehrlich, which promises to be of inestimable value in treatment. The earlier reports of treatment by this drug—salvarsan—were probably a little too rosy on account of the almost marvelous disappearance of the lesions of syphilis, which had proved refractory and indolent to other methods and which were taken as a sign of complete cure. The accumulated evidence does not substantiate these earlier reports as to the completeness of the cure, but does show that we have in this remedy a most potent means of reducing enormously the number of treponemata present in an active case, and hence in reducing to an equal degree the danger of the spread of the contagion from that particular focus, and that by careful and consistent observation and treatment an ultimate

cure may be expected in the majority of cases at least. Regular intravenous injections of salvarsan and the older mercurial treatment have little influence on general paralysis. But quite recently a new method of treatment by injection of blood serum containing salvarsan into the spinal column, or through the skull and beneath the membranes covering the brain has been receiving a great deal of attention, and some very encouraging results have been published. The cases are rather few in number, however, and no great time has elapsed since the treatment, and when we consider the tendency to remissions and relapse in this disease, it will be seen that we must go rather slowly in expecting too great results from this method.

Prevention must include education, and to be effective it would seem that the cloak of obscurity wrapped about syphilis by the lay press and in public discussion must be lifted, and the disease recognized and discussed under its own name, and with a freedom heretofore avoided. Is not the fact that it causes 10% of all cases of insanity (to say nothing of many physical conditions) sufficient warrant to set aside false modesty and face the problem openly? In some states syphilis and gonorrhea are now made reportable, like the other contagious diseases, and this will in time doubtless give us data for a better attack.

Legislative measures and personal care against such sources of contagion as the public drinking cup and common towel, will aid in reducing the innocent infections by the disease, but no scheme of prevention will be of much avail that does not recognize that prostitution is the great spreading ground of the disease, and does not attack this problem openly and fearlessly.

III.

AFTER-CARE OF MENTAL PATIENTS.*

BY HENRY P. FROST, M.D., DORCHESTER, MASS.

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AFTER-CARE of discharged hospital patients was the first effective form of social service undertaken in the field of mental medicine after the accomplishment of proper and reasonably prompt hospital treatment, which replaced almshouse care and other kinds of neglect extending over a long period. Giving assistance and encouragement to indigent and friendless persons dismissed from the hospitals as recovered or improved, which should enable them to get a fresh start in the outside world, presented itself as a practical and much needed philanthropy to many minds before its first formal and organized establishment in this country by the New York Charities Aid Association in 1906.

Dr. William Mabon of New York, in a paper

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published in 1907, reviewed the earlier efforts in this direction of Dr. Wise of New York, Dr. Dewey of Illinois, Dr. Stedman of Massachusetts, and others, as individuals or as members of committees appointed by interested organizations, and relates the whole history of the movement from its inception in the early nineties until it crystallized into action under the wise direction of Miss Louisa Lee Schuyler, a leading spirit in the New York organization referred to.

Begun on humanitarian grounds, for the benefit of individuals, after-care was early recognized to be an important item in any comprehensive program for prevention of mental disease, for, unfortunately, mental disease is very prone to recur, and if after-care of recovered patients can avert even a small proportion of subsequent attacks, its value is demonstrated. Utilized, as it should be, to dissuade recovered patients from marriage, and, in the case of the married, from further child rearing, it attacks the problem of mental disease at the best possible point—its source; and through safeguarding other members of families already invaded and their connections and friends, as is in a manner possible, the influence for good of such a system may well be incalculable.

In Massachusetts a wise provision in the insanity law, which permitted the discharge of patients on six months' probation, and which had for several years been widely used by the hospitals, was extremely helpful when it came to organizing systematic supervision of discharged patients, and their assistance. This trial period covers the most critical time, both as regards the stability of the patient's mental condition and the difficulties in the way of social and financial rehabilitation, and the facility with which further hospital treatment may be obtained at will, or in case of need be enforced with ample authority, tends to simplify many of the problems which arise in this extra-mural work of the hospitals, and gives it an effectiveness far greater than if it were dependent upon voluntary coöperation alone, like the social work of the general hospital.

In France and England, where this matter of after-care received attention earlier than in this country, it has been carried on by volunteer societies, supplying funds and workers and co-operating with hospital officials. To some extent the same plan has been adopted in this country, such organizations as the State Charities Aid Association in New York and the Societies for Mental Hygiene in various states taking it up as a part of their program, but in general it has been thought that this is work which can best be done directly by the hospitals through the agency of trained social workers, devoting their whole time to this and other forms of social work, articulating it closely with the intramural treatment and making the record of each case a part of the hospital case record.

This is the method followed in our state, where, under the stimulus of the State Board

of Insanity, which has been keenly interested in developing this phase of hospital work, each institution caring for the insane and the feeble-minded has its social worker or its corps of workers assisting the medical staff in their dealing with patients and their families for the settlement of social problems both before and after discharge,—securing data for social and medical history of cases admitted, inspecting homes and employment possibilities previous to discharge of patients, maintaining supervision for after-care and taking part in the work of the out-patient clinics where these are conducted.

The official status which this plan gives to after-care of our patients has certain advantages and also some drawbacks. The visitor enters a home with accurate knowledge of the history of the case, with the additional advantage of a personal acquaintance with the patient, obtained at the hospital, and in many cases already known to the family through her interest shown on behalf of the patient at an earlier stage of the treatment, perhaps having to her credit the helpful solution of some domestic problem brought about by the illness of the member now returning to the family circle. Furthermore, she is trained and experienced, equally at home in the hospital ward, the wage earner's tenement or the employment office, accustomed to contact with mental derangement, and possessing the point of view of the medical officers whose agent she is in this work.

On the other hand, she may appear to the former patient or to his family as an official spy, a representative of an organization which has wrought injustice by confining him in an institution—for not all recovered patients have complete insight regarding their illness—and her presence may be resented as a visualized threat of further confinement. This is one disadvantage that confronts the hospital social worker. Then again she is but one—or let us say two or three—where perhaps a dozen would be engaged were it not for difficulties connected with the budget; and finally—also for fiscal reasons—her resources for giving material aid are sharply circumscribed. Therefore, to make the after-care effort effective, to even approach in realization the widespread possibilities for good which it clearly opens to our view, the coöperation and assistance of the community organizations for relief and social welfare are necessary; and an important function of our social workers is to connect with the proper agency and in this way secure continuance of the supervision in cases requiring prolonged attention, and also in cases where particular needs of the patient or the family can best be met by this method of specialization. In addition, though, to this extension of official or semi-official aid, there is great need for the help of individuals. The best possible help and encouragement that any person in trouble or distress can have is that which comes from a friend. Therefore, the hospital's task in after-care is most satisfactorily

accomplished in those cases in which it is possible to interest and suitably instruct friends already existent, or else to find and make for the patients new friends who will extend a helping hand to them.

For the individual patient this is possible in a variety of ways, notably through church and neighborhood affiliations, through the family physician, the employer or the fellow employee. For the group, such expositions of the work and the need as we are now attending should operate to make friends and helpers. A better understanding on the part of the public of the nature of mental disorders, their causes, their course and results, will lead to a different attitude toward the returned patient and a lessening of the distrust with which he is habitually regarded and which is one of his heaviest handicaps and chief causes of discouragement and failure. I hope I may be wrong, but I venture the belief that no large proportion of the householders present would willingly receive into their domestic service on our recommendation recovered patients, but I am confident that you would do so after visiting the convalescent wards of a mental hospital, or if you could see even the unrecovered patients, of whom several hundred are living contentedly in family care under supervision of the state.

So much for general principles and plea for interest. Specifically, what are the needs of a recovered patient,—in what way do our organizations for after-care meet these needs, and what is the measure of the work they are doing? First, we must consider that a mental illness is, in general, a prolonged illness, that it involves a serious outlay which is often unwisely borne by the family in an effort to avoid treatment in a public hospital, owing to the feeling that a stigma is thereby incurred, and also to a still existent prejudice—founded on ignorance of what the hospitals really are. Or if but little actual expense has been incurred, the visitation of mental disease has curtailed the family income,—often obliterated it. As a result, when, after months of treatment, recovery finally takes place, the prospect that faces the patient is return to a world that has for him sadly changed. He has to find employment anew, pay off debts, re-establish his home. Still lacking strength, perhaps, with confidence impaired and sensitiveness increased, he has to face the most difficult situation of his life, while as yet but ill prepared for even ordinary trials.

Or it may be that the difficulty to be overcome on returning home is less financial than one of temperament or of temptation to be resisted. The home may have been unhappy, the neighborhood uncongenial, habits detrimental. The case may be that of a wife and mother whose problem is to resume the care of her household, to get her children back from temporary homes, or to remedy conditions due to their faulty supervision during her illness, or to eliminate a housekeeper or relative installed in her place; or the

patient may be one without home or family as well as without employment; and any of these may, after mental recovery, still be in need of medical care, of nursing, diet, of a country vacation. All of them are certainly in need of advice based, not only on knowledge of the case itself, but of the surrounding conditions—hence advice which the hospital physician cannot supply unaided, and which would, in most cases, be little heeded in any event unless backed up with supervision and reiteration, and, finally, they need encouragement, and in many instances substantial aid of one sort or another.

Another general need is that these discharged patients be kept in close and friendly touch with the hospital and in readiness to apply there again at any time for counsel in the event of threatening symptoms recurring,—a disposition which is greatly encouraged by the intimate contact maintained through after-care supervision.

An attempt is made by our social workers to meet these needs, and many others which I have not specified, by first investigating the homes and the conditions to which it is proposed that a patient shall return, or by finding a home for those without one, and creating conditions which promise well and getting assurance of employment or of suitable support, as well as of reasonable supervision and coöperation in the after-care by relatives or friends, or from any available source.

Upon being dismissed from the hospital on trial a definite understanding is had with the patient and with his sponsor, the arrangement varying according to circumstances, but in general an early report in person at the hospital is exacted, this to be repeated at intervals, usually of one month. A patient keeping such an agreement, and evidently doing well, is visited at home but seldom, perhaps only once, and sometimes not at all where conditions are known to be satisfactory and the family coöperative, but failure to report brings about a visit from the social worker, who then continues the home supervision.

This combination of home and hospital visits enables the staff to supervise a large number of patients during the trial visit, without requiring a larger force of visitors than it is practicable to have, and while it may be truly said that actual conditions are best seen in the home on unannounced visits, the return to the hospital has the advantage of bringing the patient actually before the doctor for observation, and if judiciously mixed with home visits it is the most satisfactory plan. Unfortunately, it is not so feasible in the other hospital districts as it is here in Boston, but the hospitals serving the more scattered districts have now provided for this kind of supervision by establishing outpatient clinics at convenient points in their territory, where the physicians attend at stated times for the purpose of seeing former patients, as well as new cases presenting. I may speak here of a very helpful relation established through

the custom of having discharged patients return to the hospital. They usually include the wards in their visit, greet the friends they left behind, encourage these by demonstration of their own recovery and well-being, and in not a few cases assist others in arrangements for discharge and employment, etc.

Former patients often continue outside the friendship formed at the hospital, and thus little social centres of mutual helpfulness are created. A men's club composed of recovered patients who need help in their fight against the drink habit meets regularly at the Psychopathic Hospital and has proved valuable to many members, and it is a frequent and pleasing occurrence in all the hospitals that former patients attend the dances and other social gatherings.

The technique of the home visitor cannot well be described in detail, being so diversified to fit the wide range of conditions encountered. It is sufficiently indicated in what I have already said about the adjustment of the environment, instruction in bodily and mental hygiene and securing of material aid to the extent possible.

The annual discharges from the public hospitals for the insane in this state are, in round figures, 2,000. A very large proportion of these patients are supervised for a period of six months, and many for longer periods, in the ways described,—not successfully in all cases by any means, but assuredly with a benefit to individuals and to the community, not to be measured by the cost of the service or by any statistics that might be compiled to show it.

(Series to be continued.)

THE ROENTGENOSCOPIC EXAMINATION OF THE STOMACH AND DUODENUM. A REPORT BASED ON THE FINDINGS IN 730 CASES, EXAMINED DURING THE YEAR 1914.*

By GEORGE W. HOLMES, M.D., BOSTON.

THE value of the roentgen ray as an aid to diagnosis in disease of the gastro-intestinal tract has been fairly well established, and many valuable contributions to the literature on the subject have appeared during the past five years.

The objection to its general use, especially in hospital clinics, has been largely one of expense.

The method described in this report has been employed at the Massachusetts General Hospital for the past two years. Results obtained by it, we believe, are at least as good as those obtained by more expensive methods, and it has made possible the use of this valuable aid to diagnosis in all classes of patients.

During the year 1914, 730 roentgen examinations of the gastro-intestinal tract were made.

* From the Roentgen Department of the Massachusetts General Hospital.

Of these, 209 show evidence of organic disease of the stomach or duodenum; 144 were operated upon and the findings proven or corrected. The following is an analysis of the findings in the proven cases.

ANALYSIS OF THE ROENTGEN FINDINGS.

A diagnosis of *duodenal ulcer* or a question of duodenal ulcer was made sixty-five times. Of these, 34 were operated upon and an ulcer found. Seven were operated upon and no ulcer found. The remainder either refused operation, or were treated medically.

Of the cases with negative ulcer findings, three were adhesions, two were chronic appendix, and two negative. In only one of these cases was the duodenum opened. There were four cases in which an ulcer was found which was not located by the roentgen examination. Of these, one was thought to be a gastric ulcer, one was adhesions, probably from a healed ulcer, in one the examination was not complete, and one was a small bleeding ulcer which was not found until the duodenum was opened.

Gastric ulcer was suspected or diagnosed 47 times during the year. Of these, 18 were operated on and found to be ulcer. Three were operated on and no ulcer found in the stomach, but the stomach was not opened. The remaining 26 were not proven. In no case was an ulcer found where a lesion had not been demonstrated.

In the three cases in which an ulcer of the stomach was not found at operation, in one the deformity was due to adhesions, and one showed no pathology. The error was probably due to the presence of spasm, or there may have been a small ulcer present, as the stomach was not opened. In one case, an ulcer on the lesser curvature, involving the pylorus, with much dilatation of the stomach, was thought to be a duodenal ulcer.

The roentgen findings suggested *malignant disease* of the stomach in 97 cases examined. Of these, 28 were operated upon and found to be malignant. Five were operated upon and no evidence of malignant disease of the stomach found. Of the five negative cases the findings at operation were malignant disease of the gall-bladder in one, one was adhesions, and in three the findings were negative. One case of malignant disease was found where no lesion was demonstrated, although the fluoroscopic findings were suggestive in this case.

In 18 cases of *adhesions*, abnormal peristalsis was present nine times, filling defects seven times, and 6-hour residue seven times. The conclusions were correct or partly so in all but one case, which was diagnosed malignant.

Seventeen cases of *gall bladder disease* (stones or inflammation of the gall-bladder) show positive findings in two, very suggestive findings in eight, one was diagnosed as duodenal ulcer, one as malignant disease, and in five the findings were negative. Abnormal per-

istalsis was present in 10 cases, filling defects in four, and a six-hour residue in seven. In about half of the cases the stomach was displaced to the right. Only two showed positive evidence of gall-stones. We have not been able to show the presence of stones in the large percentage of cases reported by other writers. This may be due in part to the type of patient studied.

Chronic Appendix. Of the 16 cases in which the stomach was examined, seven showed abnormal peristalsis, five filling defects probably due to spasm, and three six-hour residue. The conclusions were positive in four, suggestive in five, and wrong or negative in seven.

The roentgen findings in 12 negative cases were, abnormal peristalsis nine, residue two, filling defects four. The conclusions were correct in seven and incorrect in five. Of the five cases of error, cancer was suspected three times, gastric ulcer once, and duodenal ulcer once. In one case only was the stomach opened. This series of twelve cases is of interest, as it offers a chance to compare the value of the roentgen findings with those obtained by other methods. It may be assumed that the clinical findings were positive in seven cases where the roentgen findings were negative, and which showed no lesion at operation. Also for the purpose of comparison, we will assume that the clinical findings were negative in the five cases in which the roentgen findings were positive. The results are seven to five in favor of the latter.

Another interesting conclusion may be drawn from this group, namely, the negative roentgen findings are usually correct, but positive findings should be corroborated by clinical evidence.

ANALYSIS OF THE ROENTGEN FINDINGS.

Tabulation of cases operated upon from February, 1914-1915.

		Abnormal Peris- talsis.	Residue.	Filling Defect.
Duodenal ulcer.....	34	31	23	32
Cancer	29	23	22	28
Gastric ulcer.....	18	18	17	18
Gall bladder.....	17	10	7	4
Chronic appendix....	16	7	3	5
Adhesions	18	9	7	7
Negative cases.....	12	9	2	2

Tabulation of cases continued.

	Roentgen Findings Correct in	
34 duodenal ulcer.....	29	87.8%
29 malignant	28	97.6
18 gastric ulcer	18	100
17 gall bladder.....	10	58.8
16 chronic appendix.....	9	56.2
18 adhesions	10	94
12 negative	9	64
144	113	82

DUODENAL ULCER.

While irregularity in the filling of the duodenal cap is probably the most constant finding

in duodenal ulcer, occurring in 31 of the 34 cases in which an ulcer was found at operation, increase in the depth and vigor of the peristaltic wave is also quite constant, it being present in 27 cases. This finding may also occur in other conditions causing gastric irritation, such as adhesions, gall-stones and chronic appendix, but is less typical in form, the wave seldom showing much depth. The percentage in this series in which it occurred was 87 in duodenal ulcer to 58 in adhesions, gall-stones and chronic appendix, the conditions which most often cause deformity of the cap. Its absence in the presence of an atypical deformed cap is, therefore, of great help in forming correct conclusions. In other words, an abnormal cap with normal peristalsis is probably not ulcer.

Six-hour gastric stasis was present in 23 of the 34 cases, a fairly large percentage (73%); while in the other conditions causing deformity of the cap, residue was present in 58%. This finding is of further value, when the size of the residue is also considered, a large or medium residue being present in 50% of the duodenal cases and in only 17% of other conditions referred to.

GASTRIC ULCER.

Of the 18 cases operated on and proven to be gastric ulcer, in 10 the findings were sufficiently definite to make a positive diagnosis of ulcer. In eight the lesion was said to be probable ulcer, but malignant disease was not ruled out. All showed some irregularity in filling.

Seventeen showed six-hour stasis, nine showed lack of tone, and nine showed increased peristalsis. The nine cases where there was marked obstruction with dilatation and atony show sluggish or absent peristalsis.

The differential diagnosis between ulcer and cancer is often impossible, but the lesion in ulcer is usually less extensive and seldom annular; when located at the pylorus, stasis with dilatation is present early, peristalsis may be marked, which is rare in cancer.

MALIGNANT DISEASE.

In malignant disease, plates are of considerable additional value as they may bring out the mottled or finger-print appearance, described by Cole, and others. The cardiac end of the stomach may contain considerable growth and yet show no evidence of its presence upon a series of plates. In other words, the most positive finding,—irregularity of outline—is absent, and it is in these cases that errors are made on the negative side. But with careful fluoroscopic observations, particularly at the time the opaque meal is entering the stomach, such indirect findings, as delay at the cardia and irregular filling of the fundus, may be obtained and the diagnosis corrected. In the one case missed in this series, sufficient weight was not placed upon these findings, which were present. Fortunately in

this class of case, the tube findings were often quite definite.

It is fair to assume that of the 67 cases showing evidence of malignancy and which were not operated upon, some were not malignant, and that the diagnosis was corrected by the clinical finding. Therefore the greatest number of errors in this series has been on the positive side, which is the safe side. When there has been any great amount of doubt as to the findings, we have suggested malignant disease in these cases, feeling that it was the safe thing for the patient, and knowing that no radical treatment would be undertaken without corroborative clinical findings.

Can the roentgen examination replace the exploratory operation in malignant disease? We believe that in a certain number of advanced cases it can. Sixty-seven of the cases in this series were not operated upon. Some of these must be placed in this group. If there is no stasis and the roentgen findings are typical of an extensive lesion, we believe the clinician is justified in advising against operation.

The question also arises, "Do we miss the early case?" There is no evidence to prove that we do, yet we have very few cases in which a positive diagnosis was made where the growth was not too far advanced to be cured by operation. My belief is that these cases do not have sufficient symptoms to make them seek help until the lesions have become inoperable. This is especially true of hospital patients.

TECHNIC USED.

For the past year we have used the single opaque meal. The patient is allowed a glass of milk or a cup of coffee with a piece of toast at 7 a.m. He reports for examination at 10 a.m., at which time the stomach should be empty. A brief history is taken. This history is not taken with the object of combining it with the roentgen finding to make a diagnosis, but to give the examiner a chance to meet the patient and to conduct the examination in such a way that the greatest attention will be directed to those symptoms of which the patient complains. The opaque meal consists of 75 gm. of barium sulphate in 8 oz. of potato starch gruel. The stomach shadows will change in size with the amount of the opaque meal. The character of the peristalsis will also change somewhat with a different kind of meal. Therefore it is of importance that it be of standard size and composition. The patient takes the meal through a drinking tube while standing behind the fluoroscopic screen, and its passage through the esophagus and entrance into the stomach is noted.

The first swallow is taken with the patient in the oblique position, after which the antero-posterior position is assumed and the examination continued. In this way, the entire course of the esophagus is observed, the position of the stomach, and at times irregularity on the greater

or lesser curvature. As the stomach fills, the shape and position of the barium column give us an indication of the muscular tone, and by palpation we may locate tender points or fixed areas.

Pressure on the normal stomach will often force the barium through the pylorus and show an outline of the sphincter and cap. In many cases the examination may be concluded at this time, but should any of the findings vary from the normal, or if there is difficulty in obtaining a good cap and sphincter, the examination is continued with the patient in the prone position. The stomach is observed at every possible angle and in all phases of peristalsis; changes with respiration and position are considered, and the examination continued until a normal outline of the stomach and duodenum is seen, or the impossibility of obtaining it proven. We have found that by placing the patient face downward or a little upon the right side, upon the table (tube under, small screen over back), it is possible to demonstrate the duodenum and pyloric sphincter in the great majority of cases. Any defect in outline which can be reproduced upon a radiographic plate can be seen upon the screen in some of the various positions and phases. Should a lesion be found, a plate is taken with the patient in the position which best demonstrates it. Also in certain cases, showing an atypical deformity, a series of plates is taken for more careful study of variation in density seen in the barium shadows.

The patient is next given a small carbohydrate meal and told to abstain from all food and drink for six hours, at which time he is to report for the second observation. This is essentially a test meal, therefore it should be constant in size and character. Abstinence from food during the six-hour period should also be maintained. Failure to observe this point has in some clinics discredited the value of the six-hour residue. The absence or presence of barium in the stomach is noted, also the position of the head of the barium column. The ileum, cecum, and that part of the colon which is filled, are observed and palpated for fixed or tender points.

A third observation is made at 10 a.m. the following day, at which time the position, outline and contents of the remainder of the colon are studied. At this time, it is often possible to see and study the appendix.

The examination is now finished, and definite conclusions can be made in the majority of cases. It may, however, be necessary to continue the observations for one or more days until the colon is empty, or to repeat the examination after giving atropine and bromide, as described by Carman. Also when the trouble seems to be in the lower gut, to administer an opaque enema under screen observations.

Atropine tends to relax spasm. A very difficult class of case is that showing atypical deformities of outline. In the majority the deformity is due to spasm or adhesions, or both.

It is in these cases that atropine is of value. The deformity may disappear or the amount of the six-hour residue may be affected.

We have not found it necessary to give a cathartic either before or after the examination except in patients who are habitually constipated, nor has there been a single case of injury to the patient either by exposure to the ray or from barium. The digestive tract, however, should be free of barium at the time of operation.

It is only fair to state that the cases tabulated in this series represent work done at a time when the technic was being built up, and that they contain errors which would now be avoided.

In conclusion, we wish to state our belief that the technic which has been used by us, and which, with slight modifications, is that used by Barelay and Carman, offers the best chance of obtaining correct roentgen findings with the least possible cost, and that in hospital clinics, at least, it is the method of choice.

THE INCIDENCE OF VISCEROPTOSIS.

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AND

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AN examination of the literature shows that there is still considerable lack of unanimity concerning the etiology, frequency, and significance of visceroptosis. From our own study of the subject, we have come to agree with those who believe that visceroptosis is very frequently encountered, and that in a large majority of the cases it is congenital, or perhaps, better still, a predisposition to revert to a more primitive type. While acquired cases no doubt exist, they must form but a small percentage of the total. Faulty dress, corsets, repeated pregnancies, and rapid loss of weight play but a minor part, if any, in the etiology. We have frequently had occasion to examine multiparae, with relaxed abdominal walls, without finding any evidence of ptosis. The same is true following rapid loss of weight. We have encountered the condition in children of both sexes.

Apparently, we have not yet reached that stage of evolution in which our organs are ideally supported. Whereas, in the four-legged stage, the spine forms a satisfactory support for the viscera, in the upright position, on the other hand, it fails to perform this function properly. Ptosis, then, is a condition in which

the organs sink to a lower level in the abdomen than we are in the habit of calling normal. Almost all the viscera, especially the stomach, tend to be long and narrow, and to conform to the general type of the body.

It is to be hoped that with the popularization of the x-ray for routine clinical examinations, and with the adoption of standard uniform methods of investigation, this subject will be adequately studied in the near future, and that many of its mooted questions will be satisfactorily answered.

It is our object, in this paper, to present as objectively as possible a brief statistical review of material that has been collected during the past four years.

Material and Methods. The ultimate basis for this study is a consecutive series of 1600 private patients complaining of "stomach trouble." It may be well to explain at the outset that by no means all of these individuals had actual lesions in the digestive tract. Many, as might be expected, were suffering from disturbances of other systems, such as the pulmonary, cardiorenal, nervous, etc. Of this total, 898 were subjected to a routine x-ray examination. This consisted, as far as the digestive tract is concerned, in the examination of the patient at intervals after the administration of an opaque meal. In the earlier cases, 50 gms. of bismuth carbonate was used, later 100 gms. of barium sulphate. This was mixed either with 300 gms. of cereal or 500 cc. of buttermilk. In accordance with the findings of others, our results were practically the same whichever combination was used.

The diagnosis of ptosis was made from the fluoroscopic and radiographic examinations. For the sake of more ready comparison with the results of others, we have grouped as ptotic those stomachs whose lowermost point (taken when filled as above described, the patient standing), reached more than 2.5 cm. (one inch) below a horizontal line joining the top of the iliac crests. All our calculations have been worked out on this basis. However, we feel that a more conservative and perhaps safer standard would be to diagnose ptosis only when the lowermost point of the gastric shadow reaches more than 5 cm. (2 inches) below the interiliac line. The smaller group, based on this reading, constitutes 72% of the larger, and our absolute figures may, in fact, be correspondingly excessive. We believe, however, that our *relative* findings would not be found materially changed, should they be worked out for the more severe cases only.

General Incidence. In our series of 898 x-ray cases, gastropotosis occurred 579 times, a general percentage incidence of 64.4. If the alternate reading be adopted (*i.e.* ptosis = descent of more than 5 cm.) the incidence is 417, a frequency of 46.4%.

Sex Incidence. Of 483 men examined, 279 were ptotic, or 57.7%; of 415 women examined, 301 were ptotic, or 72.5%.

Age Incidence. Of 464 individuals under 40 years, 322, or 69.3%, had ptosis. Of 434 individuals, 40 or over, 257, or 59.2%, had ptosis. These findings were generally taken to mean that ptotic individuals are more likely to complain of symptoms in youth than later in life.

Age and Sex. Of 231 men under 40, 151, or 65.3%, had ptosis. Of 252 men 40 years or over, 127, or 50.3%, had ptosis. Of 233 women under 40, 171, or 73.3%, had ptosis, whereas of 182 women 40 years or over, 130, or 71.4%, had ptosis. The above general findings as to age and sex distribution, therefore, hold true in each sub-group.

Married State (childbirth). Of 122 single women, 95, or 77.8%, had ptosis; of 293 married women, 206, or 70.3%, had ptosis. Ptosis is, therefore, not "caused" by childbirth.

Age and Married State. Of 104 single women under 40, 78, or 75.0%, had ptosis. Of 18 single women 40 years or over, 17 (all but one), or 94.4%, had ptosis! This is a rather striking finding, and is also the first sub-group in which the general rule of age incidence does not seem to apply. Possible explanations are: (1) elderly single women, being generally self-supporting, are subject to greater physical and nervous strain than married women of the same age; (2) this group may represent women who are "unfit" for marriage.

Of 129 married women under 40, 93, or 72%, had ptosis, whereas, of 164 married women 40 years or older, 113, or 68.9% had ptosis.

So far we have dealt only with gastroptosis. This is simply because of the ease with which the position of the stomach can be ascertained by the x-rays. Of course the condition may be shared in varying degrees by any of the viscera of the chest or abdomen. Thus coloptosis is practically always associated with gastroptosis; in many cases the heart, kidney, liver or spleen may also join in the general descent, or any of these may be involved without ptosis of the stomach. In order to furnish some idea of the incidence of the various combinations, our last 100 cases, respectively available for each special examination, were reviewed both from the clinical and the roentgenological standpoint. Cardioptosis was diagnosed roughly from a median position of the heart, as seen during the fluoroscopic examination. No attempt was made to refine the diagnosis according to the tenets of Schwartz. All kidneys, which could be palpated *standing*, were regarded as ptotic. A palpable spleen not otherwise explicable was regarded as ptotic. A liver edge visible below the iliac crests in the "standing" x-ray plate was similarly grouped.

Our results were as follows: 22% of the hearts seen fluoroscopically were of the median variety; 77% of the livers visible in the x-ray plate

reached below the interiliac level; 30% of the kidneys which were felt for were actually palpated (in 3% of the cases both kidneys were felt); between 1 and 2% of the spleens were ptotic.

CONCLUSIONS.

1. In our x-ray series of 898 patients with digestive symptoms, the incidence of gastroptosis was 64.4%. Marked gastroptosis occurred in 46.4% of the cases.

2. The condition was only slightly more frequent in women than in men, the proportion being about 6 to 5.

3. The condition occurred more often in individuals under 40 years than in those 40 or over, and this relationship held for both sexes.

4. Gastroptosis was more frequent in single than in married women, in the proportion of about 13 to 12. In our series, practically all single women over 40 were ptotic.

5. In addition to gastroptosis, our cases had ptosis of other organs (demonstrable by x-ray or palpation) as follows: Liver 77%, right kidney 30%, heart 22%, both kidneys 3%, spleen 1 to 2%.

6. The above clinical study does not support the view that visceroptosis can be ascribed to improper garments, the occurrence of pregnancy, or to any other incidental cause. It seems that the condition is intimately related to the structure of the body, and probably arises from some congenital predisposition.

7. Ptosis is in itself not a disease. While under certain conditions in predisposed individuals, even the milder forms may cause sufficient suffering and discomfort to lead to a state of chronic invalidism, on the other hand, the most marked types need not necessarily prevent the affected organs from performing their proper functions.

Medical Progress.

REPORT ON DERMATOLOGY.

BY JOHN T. BOWEN, M.D., BOSTON.

1. DERMATITIS FROM HAIR-DYES.
2. FOOT AND MOUTH DISEASE IN MAN.
3. OCCUPATIONAL INJURIES DUE TO RADIUM.
4. ONE REPORT ON RADIUM IN SKIN AFFECTIONS.
5. HUMAN SERUM AND BLOOD IN THE TREATMENT OF PSORIASIS AND OTHER SKIN DISEASES.
6. LESSENER RESISTANCE OF THE SKIN.

DERMATITIS FROM HAIR-DYES.

Bunch¹ relates several interesting experiences that he has lately had with dyes for the hair.

The dermatitis is usually preceded by severe itching, and affects naturally the scalp and face most frequently, an intense erythema appearing first, followed by vesiculation and oozing. In severe cases there is intense oedema, and the eyes are closed. Sometimes the inflammation may extend down the chest and back, remaining stationary for days, until the direct effects of the irritant have subsided, and soothing applications have been used. As in the case of other external irritants, the inflammation sometimes does not come until several applications have been made, a result nowadays attributed to anaphylaxis. Also people who have previously suffered from an acute dermatitis from whatever cause are more predisposed to poisoning from hair-dye. The old fashioned hair-dyes, such as lead acetate in rose-water with free sulphur, combinations with henna, walnut juices, etc., are less harmful, but less effective, than the instantaneous and for a time permanent dyes, such as paraphenylene diamene, and para-amidophenol. In spite of their dangers, these are the dyes used chiefly by professional coiffeurs, both because the dyeing is quickly accomplished, in the short space of three quarters of an hour, and because the variety of possible tints is very great. Also the staining from these dyes is very thorough, penetrating even to the medulla, while the vegetable dyes, such as henna, penetrate only a short distance. They are readily oxidisable even in the air, but to increase the rapidity of the coloring, an equal quantity of hydrogen peroxide is mixed with the dye ten minutes before application. After a thorough shampoo with soap and water, the mixture of dye and peroxide is applied with a brush and allowed to remain on the hair for half an hour, and the scalp is then shampooed once more. Even in people whose skin is not hypersensitive, the neglect or postponement of this second shampoo is often enough to start an acute dermatitis.

The poisonous substance in paraphenylene diamene is chinondichloridin, a by-product of its oxidation, which has been proved experimentally to be a violent irritant, although it seems probable that other substances, produced during the oxidation, may also have well-marked irritant effects. The final non-irritating product from the oxidation is called Bandrowski's base, and this is what produces the darkening effect of the dye. The hydrogen peroxide used increases the tendency to inflammatory symptoms. If pure phenylene diamene is absorbed, rather severe systemic disturbances may be produced, such as giddiness, tinnitus, clonic and tonic contractions and gastro-intestinal symptoms.

The sale of paraphenylene diamene as a dye has been prohibited in Germany for nearly ten years, on account of its poisonous properties. Attempts have naturally been made to modify its toxic effects without impairing its powers of coloring, and the solution most frequently used in England is called "inecto," and another

"kooorpa." If any individual is susceptible, however, every dye containing paraphenylene diamene is toxic, and should be used with great care. The dye should never be left on for more than a half hour, and then the scalp thoroughly shampooed, and the skin, if stained, cleaned with vaseline. Also the dye should not be applied to hair that has been bleached less than three days before with peroxide, since peroxide acts as a mordant on the hair and increases the permeability. It is recommended in individuals who have a tendency to eczema, that a small patch of skin on the temple or back of the ear be painted with the dye, and covered with collodion, to determine if there is great susceptibility before the whole scalp is treated.

FOOT AND MOUTH DISEASE IN MAN.

Clough² relates the case of a medical student in whom the diagnosis of this affection, rare, at least in this country, seemed reasonably certain. After giving a short history of the occurrence of this disease in cattle, he asserts that most of the recorded cases in man usually run a mild course and have been observed by veterinarians and reported in foreign veterinary journals. It occurs in man in places where it is common among cattle. From 1887 to 1894, six hundred cases in man were officially reported in Germany. It is acquired either by direct contact with infected animals, or by the ingestion of infected milk, cream, cheese, or butter. There have been epidemics in entire families, from drinking infected milk, and children are especially susceptible. The sporadic cases are mostly in butchers, stablemen, milkers, and those who have to deal directly with diseased cattle. Usually the method of infection is through abrasions of the skin of the hands, or of the mucous membrane of the nose and mouth.

The symptoms in man are much like those in cattle. After an incubation of from two to ten days, there is fever, general malaise and prostration, and dryness and burning in the mouth. There is salivation and soreness, and after a few days vesicles appear on the mucous membranes of lips, cheeks, gums, tongue and on the pharynx, attended with soreness and swelling. With these appearances, the fever and constitutional symptoms usually subside. Soon the vesicles rupture, leaving superficial and very sensitive ulcers, which heal without leaving scars. There is great pain in eating and swallowing, and marked salivation. In the more severe cases similar vesicles appear on the skin of the hands and feet shortly after those in the mouth, the hands being most often affected, especially the finger-tips. When affecting the feet, it is usually the toes and heels that are involved. Occasionally there are vesicles on the genitals and about the nipples. In children especially, there may be serious systemic disturbances, and these cases may end fatally. The disease has been experimentally transmitted to calves by virus from a human subject.

Clough's case is that of a medical student of twenty, who had not been away from Baltimore for several months until the day before his illness. He had drunk no milk, but had used butter and cream. He was admitted to the hospital with intense sore throat, and tenderness, redness and swelling of the toes. On examination, it was found that his face was slightly swollen, the pharynx and tonsils strongly injected, as well as the posterior portion of the soft palate, and the cheeks especially along the line of closure of the teeth, where there were several small, slightly elevated, yellowish exudative areas. The posterior pharyngeal wall and the tonsils were covered with exudate, but there were no ulcerations. The toes were swollen as far back as the metatarso-phalangeal joints, the skin being tense, deep red and tender. There was some tingling and itching. Cultures for diphtheria were negative.

By the third day, there was much extension of the inflammatory process in the mouth, more of the cheeks and the margins of the tongue being affected. The mucous membrane was very red and sore and contained numerous small, slightly elevated, yellowish areas. There had developed marked salivation. Later all the visible mucous membrane had become affected and covered with minute vesicles or pustules. The lips were involved, showing redness, cracks, and several large flat pustules. There was no eruption on the skin of the face. On the fourth day papules appeared on the palms and backs of the hands, which later developed into vesicles and pustules, accompanied by marked itching, burning and tingling of both hands and feet. The toes were swollen and the seat of a few vesicles and hemorrhages. The eruption subsided after the seventh day, and was followed by complete desquamation. Two very good colored illustrations of the appearances of the mouth and hands accompany the article. The soreness and inflammation of the mouth began to subside by the tenth day. There was but slight rise in temperature. Attempts to inoculate the mouth of a dog from the exudate from the patient's mouth were unsuccessful.

The writer concludes that this picture corresponds to that of foot and mouth disease, and to no other; and as this disease was present at the time in cattle in this neighborhood, the diagnosis seems pretty certain. The treatment consisted of mouth washes of chlorate of potash and of permanganate of potash, and lotions to the skin to relieve the itching.

OCCUPATIONAL DISEASES DUE TO RADIUM.

Ordway,³ formerly connected with the Cancer Commission of Harvard University, now Associate Professor of Medicine in the Albany Medical College, states that Walkhoff was the first to observe that radium rays produce burns of much the same nature as do the Röntgen rays. Experiments show that there is first a painful irri-

tation, then inflammation lasting from ten to twenty days sets in. All preparations of radium produce this effect, which seems to be due chiefly to the alpha and delta rays; and this necessitates care in the handling of radium. These may be described as the rather acute reactions due to radium, and are apparently well known to physicists working with radio-active substances, as considerable experimental work has been done on animals by biologists. The purpose of Ordway's paper is to describe the more chronic symptoms and signs from a clinical point of view, and to emphasize their importance as occupational injuries.

Ordway, while investigating the subject of radium in Europe, had observed in London a sensory disturbance on the fingers of those handling radium, which had been first noticed by the difficulty in preparing eggs for breakfast in the English way. At the Radium Institute in London, the plan of rotation in service each month for the nurses handling the applicators had been adopted. In Vienna a case was observed in which the thumb, forefinger and middle finger of the left hand in one who had handled large quantities of radium showed severe lesions in the form of atrophy and obstinate ulcerations. From these observations a warning is deduced from their analogy to those of the Röntgen rays in which serious late effects, such as atrophy and cancer, may occur.

In the first year of the radium work at the Huntington Hospital, most of the applications were made by the physician in charge, in whom, a few weeks after beginning, there was noticed a slight sensory disturbance of the fingertips, especially on the ulnar side of the first phalanx of the thumb and the radial side of the terminal phalanges of the index and middle fingers of each hand, symptoms which came on gradually and consisted in a blunting of the sensibility of the fingertips, in paresthesia, and anesthesia. The objective symptoms were comparatively slight, consisting in a flattening of the natural ridges on the affected fingers, with thickening of the horny layer of the epidermis with scaling, failure of the tips of the fingers to resume their normal shape after pressure, and an up-growth of the cuticle at the base of, and underneath the nails. The nurses and assistants were warned at the outset, and told to make use of forceps for holding the active tubes of emanation. In spite of this, a certain amount of handling was unavoidable in changing the radium tubes for suitable filtration and protection. Nurses, assistants and members of the commission were later asked to describe carefully their subjective and objective symptoms. In these descriptions there was a striking similarity. In a few instances the injurious effects were due in most part to acute reactions; in two cases the effects were chronic, with superadded acute; while in two other cases there were no acute effects, but the changes were the slow and insidious effect of repeated exposures. Histological examina-

tion of a bit of skin excised from one of the cases yielded no important results. Various devices for protecting from these injurious effects were constructed, such as forceps or special vises for holding tubes, and screwing in or out of the tips and eyes; special applicators in the form of metal boxes, so that the active tubes may be added after the filtration and protection have been arranged, and the surface applicator is then slipped by forceps into a special rubber envelope and fastened with adhesive. Leaded gloves, fingers, etc., are clumsy and not readily worn. In the work of making routine applications of radium, there should be a rotation; and persons affected should be released, at least temporarily, from such work. As constitutional disturbances have been described by some writers, the body should be protected as far as possible by metal screens in form of boxes or plates about the radium, the workroom should be frequently ventilated, and periodic physical examinations of those working with this substance should be made.

Ordway's conclusions are as follows: "From the foregoing it is evident that marked changes may occur on the fingers of those engaged in routine work with radioactive substances. These local objective changes consist chiefly of flattening of the characteristic ridges, thickening and scaling of the superficial layers of the skin, and even atrophy and intractable ulceration. These lesions are usually slight compared with the marked subjective symptoms, such as paresthesia, anesthesia of varying degree, tenderness, throbbing and even pain. The persistence of such effects is noteworthy."

"Various general systemic symptoms, and also blood changes may be produced by exposure to radioactive substances. To avoid such local and general disturbance, special protective and preventive measures have been devised, and those engaged in routine handling of radioactive substances are particularly cautioned."

ONE REPORT ON RADIUM IN SKIN AFFECTIONS.

Halberstaedter,⁴ in his experiments with this treatment dealt with 37 cases of eczema, representing various types and stages, viz: intertriginous and chronic eczemas, lichen chronicus, anal and infantile eczemas, etc. Almost all had been treated previously by other methods, including oftentimes the Röntgen rays, without benefit. Almost all of the cases were very favorably influenced. The first improvement is that of diminished pruritus, which often occurs after the first application. This is to be attributed to the direct anesthetic and analgesic action of the rays. This is proved by the numbness of the fingers experienced by those who are occupied with radium. This improvement of the pruritus is especially marked in chronic eczema and lichen chronicus. In a case of excessive pruritus ani, which had also proved resistant to other methods, there was no result.

In another case the improvement was only temporary. The improvement in the inflammatory cutaneous appearances begins several days after the first applications. The redness diminishes, as well as the infiltration, and the scaling and crusting gradually disappear. Sometimes pigmentation remains as in the case of x-ray treatment. This method was found valuable in the treatment of infantile eczema and in that of small children. The treatment is easy, the children often sleeping through it, and it is applicable to all stages and to all forms. It is advisable to remove first the thick crusts and scales, to increase the penetrative power of the soft rays.

Psoriasis, which often is so favorably influenced by Röntgen rays, is also a subject for radium. Eleven cases of this affection were treated, at different stages, always with good results as to temporary improvement. No loss of hair was observed. The writer claims that the method is more agreeable to the patient than the Röntgen rays, especially when the lesions are small, numerous, and isolated: in larger patches the x-rays are perhaps preferable. An ointment of Thorium X also gave good results in psoriasis. After three applications on three successive days a light erythema is produced, especially if the ointment is bound on, and the scales previously removed. The affected areas become paler and cease to scale. As there is no doubt of the favorable influence of Thorium X on psoriasis, it is recommended to add Thorium X to the usual applications of white precipitate, and liquid coal tar.

Twelve cases of angiomas were treated with radium, or mesothorium. In the case of port-wine mark, there were no successful results, a palliation only being attained. Better results were attained in the case of deeper-seated angiomas. Keloids were more successfully treated, as has been the experience of numerous other observers. The results in four cases of lupus vulgaris were not very satisfactory. Some impression was made on the ulcerations, and infiltrations were lessened, but the lupus nodules remained unaffected.

In the case of cutaneous cancer, the favorable effect of radium rays has been so generally conceded, that there can be no doubt of the efficacy of this method. But the length of time and the strength of application required vary much with the individual case. In spite of energetic treatment, there are some cases that remain refractory, and some that are incited to increased growth. The small, superficial, slowly progressive lesions of old people, which can also be treated with benefit by the Röntgen rays, are the most favorable cases. (These cases, it should be said, may also be quite as successfully treated by mild caustics, if in expert hands. Rep.) In a few cases of verruca senilis a complete cure was effected by a single application, without a perceptible reaction. Common warts, however, were found to be uncertain, as they are with other methods of treatment. A case of multiple,

idiopathic pigmented sarcoma showed some improvement in places; in four out of six cases of leucoplakia there was a pronounced improvement. No improvement was obtained in cancer of the mucous membrane of the cheek, or in cancer of the tongue. In tumors of the tonsils, especially lympho-sarcomata, relatively favorable results were attained. Glandular affections of all kinds were very favorably affected by radium treatment, including sarcomatous glands; as well as glandular swelling in Hodgkin's disease, malignant lymphomata, and tuberculous glands. Carcinomatous glands were less amenable.

(To be continued.)

Reports of Societies.

CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

REGULAR MEETING, JANUARY 4, 1916.

DR. J. RAMSAY HUNT in the chair.

A CASE OF ENDARTERITIS OBLITERANS.

DR. WALTER TIMME of the third division presented a case of endarteritis obliterans occurring in the course of a lead intoxication. The patient, O. B. H., entered the hospital on Dec. 21, 1915, with the following history: He was 36 years of age, married, with one living child, his wife having had one miscarriage. He was a painter by trade for many years, and had had an uneventful history until 10 years ago when he suffered from a so-called appendicitis, the chief-symptom of which was intense abdominal pain. This attack lasted some three weeks and succumbed to cold applications to the abdomen. He denied all venereal diseases. During the last year he had had a typical blue line on the gums, suggestive of lead poisoning, which responded to local treatment by a dentist in a few weeks. He had had no palsies, no severe headaches, but did have pain along the sciatics and in some of his joints. In 1913, the pain in his left leg began after walking some distance. The pain ceased upon resting to recommence with walking. This intermittent condition of claudication became gradually worse so that only short distances could be covered before rest was necessary. By February, 1915, he could no longer walk at all. The left leg became heavy and more or less helpless and cold, and became the seat of extreme pain and tenderness. At this time the calf of the leg became smaller and flabby, and the thigh seemed also to lose its rotundity. He was treated with electricity and potassium iodide and steadily grew worse. This treatment was changed to hot packs, massage, rest and exposure to the sun and he apparently improved. In February, 1915, a few ulcers developed on the outer side of the left foot, which spread rapidly. They were treated with the therapeutic lamp and practically healed up. In October, 1915, the old ulcers broke down again and necrotic areas developed in their site. They were

opened widely but still continued to slough. In December, 1915, three weeks ago, the little toe and adjacent necrotic tissue were removed, but the sloughing still continued. During this entire illness the patient had suffered severe pain over the outer side of the foot and tenderness over the sciatic nerve. Upon admission to the Neurological Institute his condition was as follows: A frail, anemic, ill-nourished man, whose every posture gave him pain and who chose as least irritating, the sitting position. Examination of lungs, heart and upper extremities elicited nothing abnormal. Abdominal and epigastric reflexes were present and equal. Knee jerks were equal and exaggerated, and ankle jerks likewise. There was no true paralysis of the legs and no clonus, Oppenheim or Babinski signs were present. The pupils responded to light and accommodation and the right pupil was occasionally greater than the left. There was no nystagmus and no disturbance of mobility of the eyeballs. There were likewise no gross objective disturbances of sensibility. The tongue was coated and there was a faint suggestion of bluishness on the border of the gums. There was marked atrophy of practically all the muscles of the thigh and leg of the left side and the site of the sloughing on the outer side of the foot of that side was the center of severe radiating pain. There was felt no pulsation of the dorsalis pedis nor of any other artery of the entire leg up to and including the femoral to Poupart's ligament. Of course the patient was bedridden, unable to walk. An examination of his blood showed Wassermann negative, white and red cell count normal with some degenerated red cells. The urine contained small traces of lead. The fundi of both eyes were normal.

We therefore have a patient with an obliterating endarteritis which originally began as an intermittent claudication during a period of lead intoxication. The etiology of such conditions has always been considered obscure and yet a number have been reported as occurring in lead workers. In his article on endarteritis obliterans in Nothnagel's *Handbuch*, Professor S. Schroetter gives photographs of preparations from such arteries made by Stoercke, Paltauf and Kolisko, showing that it is the media of the arterial wall that is the seat of hypertrophy. This hypertrophy increases until an absolute occlusion takes place. The arteries of the lower extremities are especially prone to such inflammation, and males are much more frequently affected than females. It is not due, as has been largely believed, to diabetes, endocarditis or even syphilis, but is seen frequently after intoxications and infections. Even after influenza it has been reported. Kolisko, in an opinion expressed to v. Schroetter, and published by the latter, stated that he had seen it frequently in chronic lead intoxication, a condition in which the arterial walls were especially prone to a productive inflammation of the media. Victor C. Vaughan in his article on mineral poisons, also declares that the changes in the vessels in lead intoxication are those of an arteritis obliterans.

An interesting point in the therapy of these cases of lead intoxication is the almost uniformly bad result of the ingestion of potassium iodide in moderate quantities. The iodide releases much lead rapidly, which invades the weakly resistant tissue, increasing the symptoms. Sulphur seems to cause elimination without this incidental reabsorption and hence is to be preferred. As far as the obliter-

ating endarteritis is concerned, no adequate therapy has as yet been devised.

A CASE OF OPHTHALMOPLÉGIA WITH BEGINNING MUSCULAR WEAKNESS.

DR. WALTER CLARK HAUPT in presenting this case from the first division said that it was particularly interesting as the diagnosis was difficult and the etiological factor could not be determined with certainty; furthermore, that the development of a general weakness of the musculature subsequent to an ophthalmoplegia of acute onset was an unusual feature.

The patient, a married Jewess, aged 38, was admitted to the Hospital on Dec. 30, 1915, complained of inability to raise the eyelids as well as weakness and shakiness of the legs. Her family history is negative. She had measles at six, followed by paralysis of the left external rectus, coming on after pain and redness in both eyes. The strabismus was corrected by operation at the New York Eye and Ear Infirmary, 14 years ago. She has had no serious illness until last winter. Her menstrual history is normal. She has borne three children, one of whom became cross-eyed at the age of two but is otherwise well, as are the other two children. She has had two miscarriages. For the past 20 years the patient has been in the habit of drinking a glass of home distilled brandy for breakfast, about two or three times a week, as well as a glass of beer with her dinner and supper.

In December, 1914, the patient had what was considered an attack of grip, coming on with fever, chills and headache. These initial symptoms soon passed off, but gradually a stiffness of her posterior neck muscles developed as well as a sticking pain jumping from place to place all over the body. Her skin became so sensitive that it was painful to touch. She could not close the hands on account of severe pain. She was unable to change her position in bed unaided, as an attempt to do so would give her great pain. She had a sensation of pins and needles in the feet and occasionally in the hands. While the legs and arms often became stiff and painful, the joints were not swollen or reddened. From December until June, she spent much of her time in bed owing to her condition. Three times a week she went to the Ruptured and Crippled Dispensary for injections of pituitary, electricity and massage.

Her condition having become no better, she went to Mount Clemens in June, 1915, where she stayed for a month and took baths and massage. In July she returned to New York feeling quite well and strong. She had no trouble until September, when she was suddenly seized with a severe pain in her forehead and temples. This pain became constant, boring in character and aggravated at night. When it was particularly severe she would see specks and zig-zag figures before her eyes, and at times she would see double. She also complained of constant drowsiness. Medication did not relieve her headaches; they became less intense, however, during the first week of November. It was then that the patient first complained of a tired feeling in the eyes after reading. A day or two later she noticed that she could not move her eyeballs as well as usual. Two days afterward her left eyelid began to droop and one week after that the right one.

She went to the New York Eye and Ear Infirmary where she was admitted on Nov. 10. The following

reports on examinations made there are at hand: The urine showed pus, epithelial and red blood cells. The blood count was normal except for 13,000 leucocytes. The Wassermann reaction of the blood serum, as well as that of the cerebrospinal fluid, was negative. No cells or excess of globulin were found in the latter.

The report on an x-ray of her skull (Dec. 9, 1915) is as follows: She has small, fairly clear frontals, the right ethmoids and both anterior and posterior ethmoids on the left are cloudy. Antra are fairly clear. Nasal septum is thick above on left and below on right (spurs?). Lateral view shows ethmoidal and antral regions cloudy. Sella is normal.

After the spinal puncture she had a severe headache which lasted two weeks. She gradually regained some power over the right eyelid, while the left remained drooping. She found that her legs had become so weak that she could hardly stand up; while lying in bed her knees would jerk up. She also noticed a weakness of the upper extremities; on returning home from the Infirmary three weeks ago, she could not perform some of her accustomed household duties, such as cut bread.

During the past eight weeks, the patient has noticed that she tired easily when chewing, that her voice became weak and hoarse. She reports that she has had mild attacks of dyspnea and crying spells.

During the past two weeks, her legs have become much weaker and she has fallen on several occasions when attempting to walk; she feels that it has become difficult for her to rise from a recumbent or sitting position and on sitting down she lets herself fall into the seat of the chair, as her strength gives out.

Physical examination: The patient is a short and obese woman.

The cardio-respiratory system and abdominal organs are negative. Blood pressure is 150.

She has large, unhealthy turbinates and purulent secretions in her nose; the pharynx injected.

The pupils are irregularly oval in shape, the right is slightly larger than the left. Both react promptly to light and contract well during accommodation. The left cornea shows opacities due to an old keratitis. There is no diplopia or nystagmus.

Bilateral ptosis, more marked on left, is present; vision is 20/30 on the right, 20/20 on the left. Perimetric fields and fundi are normal. The left eyeball is almost rigid, except for motion inward, the movements of the right are also limited except for motion inward and downward.

Corneal sensibility is normal. Chewing movements are normal, the masseters are not fatiguable. There is no facial asymmetry.

She has no difficulty in swallowing.

Hearing is normal.

The pharyngeal reflex is present. The tongue is protruded in the midline and shows no tremor or atrophy.

The muscles of the upper extremities are flabby but not atrophied. Range of movements and muscular tone are somewhat diminished. There is a distinct weakness of her deltoid, pectoralis, biceps and flexors of the hand. The most marked weakness, however, is in both tricipites. She is unable to hold her arm extended against moderate attempts to flex it, nor is she able to extend her arm straight in front of her against the least resistance. Elevation of the shoulders, as performed by the trapezius,

is powerful, but all the movements of the head are much weakened. It must be added that these findings are subject to variation. All the arm reflexes are present. There is no intention tremor. No incoordination, no astereognosis, no adiadochokinesis nor sensitiveness over the nerve trunks.

The abdominal reflexes are not obtained. The gait is unsteady, broadbased, but not ataxic nor spastic.

The station is unsteady, but there is no Romberg. On attempting to rise from a chair the patient places the hands on the thighs for support and on sitting down she lets herself fall into the seat after flexing her legs to a certain distance. She rises from a recumbent posture with the aid of the arms.

The lower extremities show no atrophy, but the muscular power has become much diminished since admission. Tone and range of movements are normal. There is no incoordination, no Babinski or Oppenheim. The knee and ankle jerks are diminished. No tenderness over the course of the nerve trunks. There are no marked sensory disturbances, but she appears to be somewhat more sensitive to pin scratch and cotton-wool at the outer surface of both elbows as well as in the back from the fourth to the eighth dorsal spine, but no band of positive hyperaesthesia can be determined. All the spinous processes from the sixth down are more tender than those above. Similar variable and indefinite changes can be found in the legs. The laboratory examinations, including the Wassermann reaction of the blood serum and of the cerebrospinal fluid are negative. No cells or excess of globulin were found. The electrical reactions are as follows: All the facial muscles respond fairly promptly to both faradism and galvanism, the contractions being slightly more active on the right. There is no typical myasthenic reaction demonstrable. The muscles contract 150-160 times on the same minimal stimuli with only slight delay in contraction time and moderate reduction in completeness of contraction. No reaction of degeneration is demonstrable in change of formulae.

The leg and arm muscles likewise contract surprisingly well to both faradic and galvanic current of moderate intensity.

To sum up, then, we have before us a middle-aged woman who develops acutely, subsequent to severe headaches, an almost complete ophthalmoplegia with bilateral ptosis.

Two weeks afterward she complains of gradual weakening of her lower extremities, the trunk and neck muscles and the upper extremities.

At first myasthenia gravis was considered, but owing to the acute onset of the symptoms, the absence of the myasthenic reaction and of definite gross fatigability of the musculature, this diagnosis had to be given up.

The indefinite joint pains, the acroparesthesiae, the stiffness of the extremities of which she complained last winter, suggested syphilitic involvement of the posterior roots. The fact that she had had two miscarriages and the frequency of ocular palsies in syphilis of the central nervous system, and finally the severe lancinating headaches, seemed to make a luetic basis most probable. However, the negative character of the serology rules out lues as a causative factor.

As the patient has never suffered from periodic

headaches, an ophthalmoplegic type of migraine would not be considered.

Acute ophthalmoplegia often arises from some infection or intoxication and a frequent pathological cause is the polioencephalitis acuta hemorrhagica superior as described by Wernicke.

In view of the acute onset of the ophthalmoplegia subsequent to severe headaches, this pathological basis appears to be most likely. It may be that the mild tipping indulged in by the patient for many years is the primary etiological factor; other toxic or infectious agents cannot be determined with certainty.

As regards the beginning muscular weakness, a polioencephalomyelitis might be held responsible, but at this early stage it is difficult to say whether we are dealing with a beginning poliomyelitis or some form of dystrophy.

A CASE OF MYASTHENIA GRAVIS.

DR. J. W. STEPHENSON presented, from the second division, a man, age 22, druggist, who denied any venereal infection and also alcoholic indulgence. His personal previous history was negative, and no evidence of heredity was elicited. His story of present illness is as follows: "About the eighth of October, 1915, he noticed a drooping of his left eyelid. Later it developed into a complete closure of this eye. Under electrical treatment the lid returned to normal position in about 18 days. The drooping of the left lid was soon followed by drooping of the right, and there has been an alternate ptosis since. He experiences indefinite pains all over the body, especially bitemporal, weakness in lower extremities and general muscular relaxation. There have also been temporary spells of diplopia. Patient entered hospital Nov. 24. There was distinct ptosis of the left lid, and a partial of right. He is a well-developed man of good intelligence. He complained of bitemporal headaches, but this bore no relation to the ptosis. His station is normal, the upper jerks are present but not exhaustible. The lower jerks are active, the plantar responses are flexor. The epigastrics are present and equal, the abdominals are not elicitable. Eye mobility is intact and pupils respond promptly. Eye examination by Dr. Holden is negative except for the ptosis. The serological investigations revealed one positive Wassermann in the blood, whereas two others and spinal fluid were negative. Routine blood and urine examinations were negative. The electrical reactions of the orbicularis and frontal muscles revealed nothing positive, though a suspicious myasthenic reaction.

The patient remained in the hospital for several weeks, and during this time the only symptoms he presented were the ptosis, which varied somewhat from day to day, and headache. The headaches, however, were not accompanied by any particular physical manifestation of pain. He was discharged from hospital and told to report in a month.

While at home his physician reported he developed a complete left ophthalmoplegia externa.

On Jan. 4, 1916, patient reported at hospital. In addition to the left ptosis, he showed a distinct limitation of movement upward in left eye and movement downward in the right. On first effort he made a fairly good excursion, but upon continued effort he finally was unable to make any movement upward, in the left, nor any movement downward in the right. Other ocular

movements intact, and general examination as on previous stay in hospital. The right ptosis was not as pronounced. However, by this time he had developed a new symptom, namely a "peculiar feeling" in the throat. "Peculiar" was the only way he could describe it. Serum Wassermann taken was negative and examination of larynx, throat and sinuses by Dr. Farr of the Manhattan Eye and Ear Hospital revealed the following: Slight reddening of the right vocal cord. No lingual adenoids, base of tongue has chronic catarrhal condition. Radiograph shows very large sphenoidal sinus, but apparently not involved. Frontal sinus bulges but normal. Other sinuses normal.

The electrical reactions now show a distinct myasthenic reaction, the orbicularis and frontal exhausting on the application of from 16 to 25 faradisms. His blood pressure has ranged between 125 and 130mm. To summarize, about four months ago the patient develops headache with a left ptosis. The ptosis improves only to be followed by a right, and during this time there has been an alternating ptosis. In addition, there have been temporary spells of diplopia. The patient is observed in the hospital and nothing but the ptosis discovered. He goes home and the report from his physician is that he has developed a complete left ophthalmoplegia externa. He is seen two weeks later and the complete ophthalmoplegia had disappeared, although he presents remnants of same inasmuch as there is a limitation downward in one eye and upward in the other. Both movements upon continued efforts become impossible to the slightest degree. The vacillating course of the condition, the length of time taken in the development of the individual findings, together with the electrical reactions, leave no doubt as to the nature of the malady. Were it not for the electrical reactions one would of necessity consider other possible diagnoses, viz., chronic suppurative, brain tumor, and a vascular lesion of specific or other origin. However, the first could be eliminated by the course of the condition, chronic superior polio doing its damage all at once and steadily, not running an up and down course. The second possibility could be eliminated also by the course of the condition and, in the presence of a progressive condition, such as this, by the absence of fundi findings and other symptoms of cerebral compression.

The third possibility, with the present diagnosis, were the two most seriously considered when the patient first presented himself. It is apparent that the specific etiological possibility was soon eliminated. Close watch was kept on his circulatory apparatus and though the ptosis varied and also his other complaints, the condition of his blood pressure, pulse, peripheral circulation remained quite constant, nor was there discernible any abnormality in his entire circulatory make-up.

The case is interesting in that the course is progressing in a rather classical manner, and exemplifies the fact that often in the early stage of the condition the myasthenic reaction is wanting in consequence of which in the presence of a ptosis in the young, especially if the degree is changeable, we should always bear in mind the disease known as myasthenia gravis.

AN INTERESTING CASE OF FACIAL PARALYSIS.

DR. WILLIAMSON presented, from the first division, an unusual case of facial paralysis. The pa-

tient, a young Italian woman, 30 years of age, married, who seeks relief from facial paralysis.

She recalls no diseases of childhood. Typhoid at the age of 17 and made a good recovery. She was married at 22 and has three children, but reports that she has never felt really well since the birth of her first child. She has had no miscarriages but she has complained of indefinite pains in her abdomen, backache, faint dizzy spells ever since this time. She says every doctor who has treated her has called her hysterical. One of her children has hip disease. Her menstrual life began at the age of 15 and has always been regular. She has had some sort of pelvic operation six years ago, the nature of which she does not understand. Her family history is negative.

About six weeks ago she was suddenly seized with severe pain in the left ear with a red spot at the orifice of the external auditory meatus. Pain extended back of the ear over the mastoid tip and down the neck. This lasted about three days and then a little matter appeared on the ear, which was yellow. The pain then left her about a week and began again in the right ear, lasting a few days. The pain then reappeared in the left ear and was exactly similar to the first attack. The red spot again appeared in the same place but this time there was no further discharge of pus. She went to Bellevue where a diagnosis of cerumen and eczema was made. This lasted a week, when she got a chill, general headache, pains in the arms, and sore throat. She had a temperature and was put to bed by her doctor who told her she had the grip. There was, however, no discharge from the ear at this time.

The pain became very severe around the ear for one night and then it began to moderate for several days. Then she was again seized with a severe pain in the whole left side of the head, which she describes as a twisting, cutting, stabbing pain, coming on after exposure to cold. Three or four days later the left half of her face became paralyzed. There was no dizziness nor vomiting accompanying this pain, but she felt extremely weak, had precordial oppression and sensation of smothering with a moderate degree of pain in the shoulders.

Her examination reveals a complete left-sided peripheral facial paralysis. The frontalis muscle is flat and smoothed out, the left cheek is flat and smooth, she is unable more than partly to close her left eye, she is unable to retract the left angle of the mouth or elevate the nose. Electrical examination shows that all the muscles of the side of the face respond to both faradism and galvanism. There is a distinct reduction, however, in the force and promptness in the contraction of the muscles of the left side when compared with those on the right. This is most marked in the occipito-frontalis and orbicularis. There are no changes in the formula demonstrable. An aural examination by Dr. Dench shows both drums thickened, depressed, lusterless, myotic spots. No difference in hearing to low whisper or tuning fork 256 vibration and the tone limits of right and left ears are normal. There is no spontaneous nystagmus, but nystagmus is present both right and left when the ears are flooded with cold water. Ataxia on standing, falls to the right. Double cathode causes nystagmus to the left.

A careful sensory examination of the concha, drum or skin over the face, fails to reveal any disturbance of sensation either to touch or pin prick

but all the sensory points of her fifth nerve, the posterior auricular branches and the point over her jugular ganglion are extremely tender to pressure. There is no difference in corneal sensibility.

The interpretation suggested by the history of recurrent attacks of pain, the last of which was accompanied by a facial palsy in a woman of unstable vasomotor system, is that we are dealing here with a rather extensive inflammation of the entire sympathetic chain, including the geniculate, otic and jugular ganglia, and that the most probable explanation of the red spot on the concha was a herpes.

Harvard Medical School.

MEDICAL MEETING

IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, ON TUESDAY EVENING, MARCH 28TH, AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

INFORMAL REPORTS UPON CURRENT WORK IN DIABETES.

PROFESSOR T. A. BENEDICT: "The Respiratory Quotient in Diabetes."

There is no better way to realize the enormous change which has come about in our conception of diabetes than to trace the work recently done on the respiratory quotient. Two years ago it would have been a simple task to review our knowledge of this subject in a single evening. At present we can but touch upon it in a general way.

By the respiratory quotient is meant the relation between the volume of CO_2 excreted and the volume of oxygen consumed. When the measurements are carefully made the ratio reads about 0.7. The respiratory quotient of fat is about 0.7 and of protein about 0.81. About 15% of the total energy of the body comes from the combustion of proteins. Accordingly, the respiratory quotient has to do chiefly with the metabolism of fats and carbohydrates.

The determination of CO_2 is comparatively simple. That of oxygen, however, is extremely difficult. The determination of both, therefore, requires very great skill and care.

As a result of the modern Allen treatment of diabetes there is a profound change in the respiratory quotient. Where this form of treatment has been pursued in whole or in part we can no longer predict exactly what the quotient will be. Frequently it is very high—0.79 or even 0.81. It is difficult to explain just why this occurs.

The important question, however, is whether the diabetic under treatment can burn more sugar than he could without treatment. There are several indices of whether such a patient is really burning an increased amount of carbohydrate. One method consists of giving levulose and watching the respiratory quotient. When 100 gms. are given a definite increase in the quotient is occasionally noted. A fact which is often lost sight of is that the combustion in the body normally maintains a regular level regardless of the food intake. The levulose, under such circumstances, is either burned or it is converted into fat. When a severe diabetic reacts in

this way it is a very conclusive proof that the carbohydrate undergoes one or the other of these transformations. If it is converted into fat it is of course available for energy.

Discussion by DRs. BOOTHBY AND TALBOT.

PROFESSOR W. R. BLOOR: "The Significance of Blood-Fat in Diabetes."

Up to the present time in the study of diabetes attention has been paid chiefly to two phenomena; the decreased utilization of carbohydrates, and the presence of acidosis. The fact that such patients live, in part, on their fat-burning mechanism has been largely overlooked.

By the term blood-fat we include four groups of substances; (1) the true fat; (2) lecithin, a modified fat; (3) cholesterin; and (4) cholesterin esters of the fatty acids. We regard as important in a determination not only the actual amounts of the various constituents but also the relationships between them. In normal bloods the variation in amounts of these substances ranges from 15 to 20 per cent. In fasting the blood fat may or may not increase, depending on the person examined. The same is true of narcosis. Here the percentage of fat depends upon the narcotic used. Of the pathological states the most important are diabetes and alcoholism.

At present we have very little reliable data regarding the blood fat in these conditions. This is due to several factors, the most important of which are that the fats have been incompletely extracted, and some of the constituents, lecithin particularly, have been in part destroyed by the use of heat in the extraction.

The technic used in the work reported here consists of micro-methods. Such methods obviate the use of heat and permit the determinations to be carried out within a half hour or an hour from the time the blood samples are drawn. The figures derived in this way, accordingly, are higher than those which have been previously reported.

For the purpose of this discussion the fat-burning mechanism may be expressed as follows:

Fat $\rightarrow$ lecithin $\rightarrow$ attack by cells $\rightarrow$ complete combustion of fat.

In disease this mechanism may break down at any point. In order then to force the cells to attach the lecithin the latter must be greatly increased in amount, etc. At present this is probably the best explanation why there is an increased blood lipid in such cases.

Discussion by DR. FOLIN.

DR. A. A. HORNOR: "The Carbon Dioxide Tension of the Alveolar Air in Diabetic Patients."

The chart on the next page has been constructed from the results of an analysis of three hundred tests.

DR. E. P. JOSLIN: "The Prevention and the Treatment of Diabetic Acidosis Without the Use of Alkalis."

Acid poisoning has been responsible for the deaths of 66% of all my cases. In children, which have constituted about 7 or 8% of my cases, 100% of the mortality has been due to it. These figures show the striking importance of acidosis. Of the diabetic patients who succumbed during the first year of the disease 86% of the deaths were due to coma. Since diabetes is a chronic disease, however, there should be comparatively few deaths from it during the first year. Figures taken from the records of the Massachusetts General Hospital show that 67% of the

fatal cases had lived only one year or less subsequent to the appearance of the disease. In the years between 1898 and 1913 the deaths of this type reached only 41%. These figures show an improvement, though the treatment antedated the modern handling of diabetes. Naunyn's figures for this period are even better—31%.

	CO ₂ Tension.	Diabetic. Acid.	NH ₃ .	Carbohydrate Bal- ance. No. of Observations.	Positive Negative.
Living Cases. No soda.	Not fasting, CO ₂ { 22-25	++	3-5.7	3	3
	Varied from 18 { 25-33	++	2-3.6	8	8
	to 46 mm. { 33-36	++	1.3-3.7	64	18
	Fasting CO ₂ { 30-36	++	2.0	35	4
	Varied from 18 { 30-46	++	1.8	46	0
Living Cases. Taking soda.	Not fasting, CO ₂ { 18-27	++	2.4-3.5	3	16
	Varied from 18 { 25-33	++	1.7-3.4	8	14
	to 38 mm. { 33-39	++	1-1.7	9	1
	Fasting soda { 28-38	++	1-2.8	—	—
	No soda { 7-20	++	0.8-1.8	0	All
Fatal Cases.	Soda { 14-55	++	0.6-5.0	0	All

Of the fatal cases in Boston during the past year 27% died during the first year of the disease. This shows a striking improvement. In my own cases, 99 in number, only 17% died during the past year, and 95% of these had had the disease longer than one year. There are several factors which account in part for this low mortality. My own facilities are exceptional since but one nurse has handled all of these patients and since several others experienced physicians have also worked with them during this time.

We have proceeded on the assumption that if the signs of acid poisoning could be prevented from making their appearance then the patients could be prevented from dying of coma. The Allen treatment has enabled us to carry this into practice. Where there has been any doubt about the advisability of using the starvation treatment we have cut the fats from the diet, as most of the acids are made from fats. Then in succeeding days the carbohydrates have been gradually cut down. The majority of the patients became sugar-free before the fasting was necessary. Such a course is particularly useful where the kidneys are damaged, since but little acid can be excreted by poor kidneys. One must never-

theless be very cautious in advising against the use of soda. This preventive method of treating acidosis is worth while for when a patient gets into coma there is comparatively little that can be done. A number of children who might have died in the hospital in the endeavor to make them sugar-free according to the old practice, by simply cutting out the fat and then slowly cutting down the carbohydrates have been rendered acid- and sugar-free within comparatively short periods.

In acid poisoning of the severest type the cases are now treated without alkali. Here, as Naunyn pointed out, it is essential to treat not the acidosis but the diabetes. This treatment consists of alternate periods of fasting and feeding. While fasting may lead to an increased acidosis at the beginning of the treatment, later fasts lead to a lessened degree of acid poisoning. The periods of feeding are then gradually lengthened while the fasts are shortened. With this method no severe cases have been unsuccessfully treated, though there may be cases which cannot be made acid free.

Discussion: Drs. BRIGHAM, CHRISTIAN AND PEABODY.

ERNEST G. GREY, M.D.

Book Reviews.

Anatomy of the Brain and Spinal Cord. By HARRIS E. SANTEE, A.M., M.D., Ph.D. Fifth Edition, Revised and Enlarged. Philadelphia: P. Blakiston's Son & Co., 1915.

The anatomy of the central nervous system is a subject so technical, and so difficult of clear text-book or didactic presentation to students, that so excellent a monograph as Dr. Santee's is of particular value both for students and for practitioners. This fifth edition of an admirable and already well-known work has been largely rewritten in accordance with the discoveries of recent years. The embryology is more fully incorporated with the text than is the case with the fourth edition, and on this account the special embryologic chapter is omitted. The book is written with special reference to mechanism and function. For this reason, particular importance is attached to the localization of the functional centres, the tracing of afferent, associative and efferent connections, and the origin, crossing and termination of conduction paths. Everywhere function is correlated with structure. The terminology of the B. N. A. has been adopted throughout, and in cerebral anatomy particularly this is of great advantage to clearness. The book is well illustrated with 158 illustrations, of which 46 are printed in colors. It is a work of definite and permanent value to students, and to those practitioners whose special interest involves the necessity of constant familiarity with cerebro-spinal anatomy.

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A NOTEWORTHY SCIENTIFIC MEDICAL DISCOVERY.

In a brief article in the issue of the *Journal of Medical Research* for March, 1916, which has just come to hand, Dr. F. B. Mallory and Dr. E. M. Medlar, from the pathological laboratory of the Boston City Hospital, present a preliminary report of their epochal work on the etiology of scarlet fever. They have succeeded in isolating from the tissues of children dying early in the course of the disease, especially from the tonsils, palate, pillars of the fauces, root of the tongue, trachea, and lungs, a strongly gram-positive bacillus, growing in large and small clumps, in practically pure culture, between the epithelial cells. This bacillus stains well with ordinary dyes and shows a tendency to irregularity of staining in lightly stained preparations and in too strongly decolorized gram preparations. No polar bodies are present. In culture, the organism is slightly smaller

than the diphtheria bacillus, and varies from coccus-like to large bacillary forms. The authors further describe the cultural characteristics of this organism, which is a facultative aëroë, and feel it reasonable to infer from their observations that the disease—scarlet fever—may be due to this bacillus, which they have provisionally named *Bacillus scarlatinæ*, less virulent than the diphtheria bacillus and infecting practically the same locality. "The toxin causes necrosis and denudation of the covering epithelium and leads to an exudation of serum and polymorphonuclear leucocytes. Fibrin formation is usually absent or slight. On this account the primary gross lesions are inconspicuous and easily overlooked." The streptococcus, which has hitherto sometimes been regarded as the cause of the disease, is, therefore, to be considered merely as a secondary invader.

Assuming that these preliminary results are confirmed, of which there seems little doubt, the authors of this important piece of research have contributed to medical science a discovery of the first magnitude. It is only three years ago that Drs. Mallory and Hornor contributed, from the same laboratory, valuable knowledge on the histologic, mechanical lesion of pertussis and on the relation of the Bordet-Gengou bacillus to that lesion. This work was editorially described at the time in the issues of the *JOURNAL* for November 21, 1912, and January 2, 1913. Dr. Mallory's present contribution promises to eclipse in importance that of the former work. Yet both are evidences of the same type of effective scientific investigation.

With its wealth of clinical material, the South Department of the Boston City Hospital was logically the place where the discovery of the etiology of scarlet fever should have been made; but to make it, necessitated the insight, patience, and scientific genius of the true discoverer, and the necessary means for carrying out the investigation. The former were found in Dr. Mallory; the latter was provided through the influence of the mayor, to whose initiative the opportunity for accomplishing the work was due. The credit for this part of the work is recognized as follows by Dr. Bradford in a letter to the mayor, commenting on the discovery recently announced, and published in the daily press:

"As you know, a scientific fact is not accepted until it is confirmed by other observers, and it will be some time before investigators will have the opportunity to confirm Dr. Mallory's researching. He is, however, so careful a

man, and so restrained in his statement, that there can be little doubt of the importance of the work and of the probable far-reaching consequences.

"When General Leonard Wood was governor of Cuba, he risked his reputation and adverse criticism by ordering a substantial financial grant for the investigation of yellow fever. A narrower-minded man would have hesitated to do this, but Gen. Wood is not afraid, when right, of criticism. The results were, as you know, that yellow fever is no longer a scourge in properly governed communities.

"I have been informed that Dr. Mallory's recent work was due to your initiative and aided by Dr. Mallory's interest. You have, therefore, earned not only the thanks of the profession and of the community, but also, like General Wood, a life-long satisfaction for your share in an undertaking which may prove of inestimable help to humanity."

Dr. Mallory's discovery, if confirmed, is the first step, but a long and important one, toward what may be expected to prove the ultimate control of scarlet fever, like that of diphtheria. It demonstrates the etiological agent of the disease and its primary essential lesion, and clears the way for further investigation in the search for a vaccine or antitoxin by which it may be prevented, controlled or cured. Such treatment and control of this very serious infection would be an immense advance in clinical medicine, in the prevention of infant mortality, and in the betterment of the general public health. Such a piece of research successfully completed is not only a notable credit to its authors and a matter of congratulation to the Boston profession, but it is a valuable and beneficent contribution to the progress of medical science, in the knowledge and control of human disease, suffering and death.

IMPORTANT NEW DATA ON BOTULISM.

It has been known since Van Ermengem's studies (*Ztsch. f. Hyg. u. Infec. Krank.*, 1897, xxvi, 1; *Arch. de Pharmacol.*, 1897, iii, 213, 499), that the bacillus botulinus produced a toxin of high potency, which caused a profound and characteristic effect in the body. The bacillus itself is not pathogenic and does not grow in the body under ordinary conditions, but under certain fairly definite conditions elaborates its toxin in food products, and when these are eaten, poisoning quickly ensues. Unlike most

bacterial toxins, this one is absorbed from the gastro-intestinal tract, and therefore its presence in food is particularly dangerous.

The bacillus botulinus is an obligative, anaerobic, spore-bearing bacterium, which requires darkness and moisture for growth. These conditions are excellently fulfilled in canned foods, and less perfectly in meats, such as sausages. The clinical picture of botulism represents a central nervous system involvement rather than a primary attack on the gastro-intestinal tract, and shows paralyses, especially of the ocular muscles, weakness and a characteristic absence of sensory symptoms. The course progresses to a bulbar palsy. The disease has been almost universally considered to arise only from the ingestion of meat which contained the toxin of bacillus botulinus. It has also been generally considered that animal proteids were necessary for the development of the bacillus and the elaboration of this toxin. Danger of poisoning was, therefore, supposed to be limited strictly to animal food.

In a recent communication important new data are presented by E. C. Dickson from the division of medicine of the Leland Stanford, Jr., University School of Medicine (*Jour. A. M. A.*, 1915, lxv, 492), who gives experimental and clinical proof that the bacillus botulinus may develop on certain vegetable proteids, as well as on those of animal origin. The value of this contribution is self-evident, as it at once incriminates canned vegetable foods as a possible source of botulism, a possibility which is enhanced by the spore-bearing character of the bacillus and by the often inefficient sterilization of home-canned vegetables and fruits.

Dickson found a number of cases which were probably botulism, due to ingestion of canned vegetables or fruits. One such case, with autopsy, was reported as such by Wilbur and Ophuls (*Arch. Int. Med.*, 1914, 589), where botulism followed ingestion of a salad made from home-canned beans. An epidemic of 21 cases with 11 deaths was reported from Darmstadt by Landmann (*Hyg. Rundschau.*, 1904., xiv, 449). Two other reports were collected by Dickson, both of epidemics in California, where probable botulism followed ingestion of home-canned pears and apricots. With these exceptions, which had previously attracted little attention, botulism has been held to be due strictly to ingestion of animal proteids containing the toxin.

A series of experiments was carried out by

Dickson along the following lines, to determine if it were possible for the toxin of botulism to be formed in vegetable media. One cc. of a suspension of bacillus botulinus in normal saline was injected through a nail hole into tins of canned string beans, which were then re-soldered. The beans were a high-class grocery product in one-quart tins. The tins were incubated at room temperature for from three to twelve months, after which they were opened, the reaction tested, aerobic and anaerobic cultures made, and some of the fluid was injected into rabbits, guinea pigs and cats. Of the 16 guinea pigs, 16 rabbits and 13 cats injected, 4 guinea pigs, 7 rabbits and 5 cats died, and a number more showed symptoms for a few days, but recovered. Of the 16 animals that died, 13 showed characteristic post-mortem lesions. Most of the tins, after incubation, showed an acidity of from 2 to 2.5% to phenolphthalein. Bacillus botulinus in pure culture was recovered from 6 of the 12 tins.

These results furnish striking evidence that bacillus botulinus can develop and produce its toxin in vegetable media, that animal proteids are not essential for its development, and that the ordinary acidity of canned vegetables does not prevent this growth. Canned vegetables and fruits furnish an ideal medium for the bacillus, which requires an absence of air, moisture, darkness, and a temperature optimum of from 72 to 82° F. The spores resist a temperature of 185° F. for 30 minutes, so that without fractional sterilization it is evident that home-canned vegetables and fruits may be exceedingly dangerous. Dickson found specifically that string beans and peas were available culture media. It will be a matter of no small importance to determine, first, whether all or only certain special vegetables and fruits will allow development of this bacillus, and, secondly, what specific chemical substances, presumably proteids, are the essential ingredients of these culture media.

In the case reported by Wilbur and Ophuls, the latter found that the most characteristic lesion seemed to be a thrombosis in the arteries and veins of the central nervous system. Dickson confirms this strikingly, and finds that the toxin produces a disturbance of the circulatory system, which leads to hyperemia and hemorrhages into the meninges and central nervous system, and to thrombosis in the arteries and veins in these locations. The nerve-cell lesions

localized in the Nissl granules and nerve-cell nuclei, which have heretofore been considered the only characteristic lesions, are found by Dickson to be due, not to a specific action of the toxin on the cell protoplasm, but to be secondary to disturbed blood supply. This is as important a contribution for the pathology of botulism, as is the demonstration of vegetable culture media to its etiology.

Confirmation and further work along the lines suggested are strongly indicated. It is also a matter of importance to determine the natural habitat of the bacillus botulinus. As Dickson says, the pig is under suspicion, and Kempner and Pollack have recovered the bacillus from pigs' feces (*Deut. med. Woch.*, 1897, xxiii, 505).

ANTI-MENINGITIS SERUM.

PHYSICIANS will be glad to learn that the Rockefeller Institute for Medical Research has resumed the preparation of anti-meningitis serum because of the prevalence of epidemic meningitis in the armies in England and France and the consequent demand for the serum. Meningococcic meningitis has prevailed either in epidemic form or sporadically in many European countries during the past ten years; and now that we know the manner in which the disease is conveyed, namely, by means of meningococcus carriers, who harbor the microorganism in the nasopharynx, the appearance of meningitis in widely separated countries and places is not at all remarkable. The bringing together of recruits has had the effect of introducing carriers of the infection into the European armies and may do the same to the army of the United States.

Elser and Huntoon (*Jour. Med. Research*, 1909, 20, 371) described an organism indistinguishable from the meningococcus except by means of the agglutinin absorption tests, and gave the name of "pseudomeningococcus" to this organism. In the same year Dopfer (*Compt. rend. Soc. de Biol.*, 1909, 67, 74) studied and described a similar organism, obtained from the upper air passages, to which he gave the name "parameningococcus." This was found by Dopfer and other French workers to invade the blood and meninges, and they considered it to

be identical with the pseudomeningococcus and as one of the causative agents of epidemic meningitis. Martha Wollstein, of the Rockefeller Institute, (*Jour. Exper. Med.*, 1914, 20, 201) made a careful comparative study of the immune reactions of the meningococcus and the parameningococcus of Dopter and came to the conclusion that the parameningococci of Dopter are culturally indistinguishable from the true, or normal, meningococci, but serologically they exhibit differences as regards agglutination, opsonization, and complement fixation. Because of the variations and irregularities of serum reactions existing among otherwise normal strains of meningococcus, she did not think it seemed either possible or desirable to separate the parameningococci into a strictly definite class but to consider them as constituting a special class among meningococci, not, however, wholly consistent in itself. This view has been adopted by Captain Ellis (*British Med. Jour.*, 1915, ii, 881) who studied the subject in the mobile laboratory, British expeditionary force, France. He thought the causative agent of cerebro-spinal fever, the meningococcus, to be of at least two types which are independent as regards agglutination, and that, in a study of forty-six strains obtained from patients in six different epidemic foci in England and France, both types occurred, the normal meningococcus in twenty-nine cases and the parameningococcus in seventeen. He found both in the nasal pharynx of healthy carriers. Joseph A. Arkwright, also, (*Brit. Med. Jour.*, 1915, ii, 885), working independently in the Lister Institute of Preventive Medicine, arrived at practically the same conclusions. He found that rapidly fatal cases of meningitis occurred from infection with either type of meningococcus. Thus it seemed desirable that both should be represented in a curative serum.

A new method of manufacturing an anti-meningitis serum has been developed at the Rockefeller Institute by Amoss and Wollstein (*Jour. Exper. Med.*, 1916, xxiii, No. 3, 403-417) by which horses are immunized in from eight to twelve weeks, as contrasted with the old method which required from six to twelve months to produce a meningococcic serum of high immunity value. They make three successive intravenous inoculations of living meningococci and parameningococci, repeated at stated intervals, avoiding sudden and alarming symptoms and sudden death in the horses first by employing a desensi-

tizing injection and then by adjusting the doses according to the febrile reaction and by making the highly diluted injections slowly. The authors consider the new method preferable to the slower, subcutaneous methods; the horses undergoing this process of immunization remain in good condition and they even gain in weight. The serum produced has been employed therapeutically in America, England, France, and some other countries, and should be a more reliable therapeutic agent than the commercial sera recently employed abroad.

MEDICAL NOTES.

PREVENTION OF TYPHUS INVASION.—Report from San Antonio, Texas, states that on March 22, the ports of Roma and Rio Grande City, Texas, were opened to immigration, and agents of the U. S. immigration and public health services were established at these cities which have been without such officers for many years. This step was taken to prevent the entrance of typhus fever into the United States from Mexico. Fumigation equipment and gasoline baths have been installed at both stations.

APPROPRIATIONS FOR MEDICAL EDUCATION.—Report from New York states that on March 23 the general education board of the Rockefeller Foundation made appropriations amounting to \$2,670,874 for the reorganization of clinical instruction at Johns Hopkins, Yale and Washington Universities on the full time basis. This plan had already been established at Johns Hopkins and is to be extended to the other two institutions.

BUREAU FOR THE STUDY OF THE ABNORMAL CLASSES.—In the issue of the JOURNAL for February 10, 1916, we commented editorially on a bill which had been introduced before the National Congress in 1914 for the establishment of a bureau for the study of the criminal, pauper and defective classes of the United States. At the time this measure failed of passage, but on March 10, 1916, it was reintroduced before the United States Senate as a new bill (S. 4990) and has already been read twice and referred to the committee on the judiciary. Its plan of work was previously endorsed by the American Bar Association and by several medical societies. The text of the bill was published in the issue of the JOURNAL above referred to and readers interested in its passage are urged to write their representatives upon the subject.

BARLOW SANATORIUM.—The twelfth annual report of the Barlow Sanatorium Association for

poor consumptives, located near Los Angeles, California, records the year's progress as follows: The number of patients treated during the year was 130, 47 remaining in the Sanatorium at the end of the fiscal year, leaving a total of 83 to be reported upon. Twenty-four patients, or 29.2%, were discharged arrested or apparently cured; 23, or 28%, were discharged with the disease quiescent; 14, or 17%, improved; 9 patients did not improve and 4 died at the Sanatorium. In addition to the regulation methods of treatment, heliotherapy has been employed to some extent, but while the benefit is apparent in two cases, the time is too short to draw definite conclusions as to its efficacy.

WAR RELIEF FUNDS.—On April 8 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$112,064.67
Serbian Fund	85,194.04
American Ambulance Fund	75,926.58
Allied Fund	73,940.90
French Wounded Fund ..	68,306.41
French Orphanage Fund ..	37,579.24
Armenian Fund	36,408.39
Polish Fund	28,587.57
Surgical Dressings Fund ..	22,839.17
La Fayette Fund	19,663.53
P. S. D. Fund	7,796.73
Cardinal Mercier Fund ..	2,583.00
French Relief Fund	1,825.00
Allies' Tobacco Fund	1,177.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 8, 1916, there were 243 deaths reported, with a rate of 16.66 per 1,000 population, as compared with 287 and a rate of 20.00 for the corresponding week of last year. There were 37 deaths under 1 year as compared with 38 last year, and 79 deaths over 60 years of age against 91 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 44; scarlet fever, 61; measles, 126; whooping cough, 40; typhoid fever, 3; tuberculosis, 45. Included in the above were the following cases of non-residents: Diphtheria, 9; scarlet fever, 21; measles, 2.

Total deaths from these diseases were: Diphtheria, 4; measles, 1; whooping cough, 3; tuberculosis, 19. Included in the above were the following deaths of non-residents: Diphtheria, 1; whooping cough, 1; tuberculosis, 1.

WORK OF HOSPITAL SHIP.—The United States coast-guard cutter *Androscoggin*, which has been serving during the past season as a hospital ship for fishermen off the Banks and along the coast of the maritime provinces, is now in dry

dock at Boston for brief repairs, at the close of her latest cruise. Since November 1, 1915, the *Androscoggin* has cared for 156 patients, 11 of whom were transferred ashore for hospital treatment, the remainder being treated aboard as out-patients. Within a few days the *Androscoggin* will begin her spring cruise.

HOSPITAL BEQUESTS.—The will of the late Mary E. Barnes of Allston, Mass., contains bequests of \$1000 each to the New England Baptist Hospital, Boston, and to the Norfolk Provident Hospital, at Norfolk, Va. The residuary estate is also divided between these two institutions.

MASSACHUSETTS GENERAL HOSPITAL TRAINING SCHOOL.—The report of the Massachusetts General Hospital Training School for 1915 states that the number of nurses in the school is 183, of which number 29 are graduates and 33 probationers. About 34 graduates of the school have engaged in war nursing, one, Mrs. Jaggard, who was matron of a hospital on the island of Lemnos, losing her life in the service. There have been 1075 nurses graduated from the school since its inception, of whom about 520 are engaged in active work.

LEGISLATIVE NOTES.—At a recent meeting of the Massachusetts Legislative Committee on Public Health, it was voted to report favorably the bill, now pending before the General Court, to allow the registration of a so-called Chinese herb doctor as a practitioner in this state. Of the seven members present, three were opposed to the measure, and the four absent members are to be polled before a decision is reached. It is, perhaps, needless to add that this measure is, of course, totally disapproved by the medical profession. The bill was presented and defeated at last year's session of the legislature, and should meet the same fate this season.

The committee on public health has also voted to report favorably the Kearney bill, requiring all physicians to report to the State Department of Health all cases of occupation disease, such as arsenic, lead, mercury, phosphorus and wood alcohol poisoning, anthrax and caisson disease.

The legislative committee on social welfare has recently reported favorably a resolve for the appointment of a special commission on social insurance to sit during the recess of the legislature, for the investigation of illness, unemployment and old age, and to recommend such legislation as it may deem desirable for the protection of wage earners. The commission is to consist of two senators, four representatives, and three other persons, to be appointed by the Governor.

OPENING OF NEW HEALTH UNIT.—The first of the series of health units, projected by Dr.

Francis X. Mahoney, Boston Health Commissioner, was officially opened last week at 17 Blossom Street. This unit, which will be under charge of Dr. Charles F. Willinsky, is modeled after the units of a similar nature already successfully established for some time in New York City.

Associated with the local health board in the conduct of the unit are the Women's Municipal League, the Federated Jewish Charities, the Milk and Baby Hygiene Association, the Instructive District Nurses' Association, the West End Mother's Club and the Boston Dispensary.

Nurses will be in attendance at the unit for the care of the sick, for maternity cases, and to give instruction in hygiene in the homes. Dr. Fred Bailey will conduct an occupational clinic. He will instruct the market-men and bakers in the hygiene of food preparation and sale.

A representative of the Federated Jewish Charities will receive reports of needy cases from nurses and doctors, and agents of all other societies connected with the institution will make their headquarters in the unit.

In conjunction with the opening of the unit, a series of evening meetings were held to call it to the attention of the community. At these meetings there were addresses by Mr. Michael T. Jordan, deputy health commissioner; Miss Mary Beard, director of the Instructive District Nursing Association; Dr. J. Herbert Young, director of the Boston Milk and Baby Hygiene Association; Professor Selskar Gunn, of the State Health Commission; and Mr. Michael Davis, director of the Boston Dispensary.

"Miss Beard outlined the work of the Instructive District Nurses' Association and showed slides of the members of the staff at work among their patients. She emphasized the fact that a nurse can be secured from the association for the treatment of any disease but a contagious one. A maximum fee of 50 cents is charged for each visit. This fee is omitted in cases where the patient is unable to pay for the nurse's services. The speaker said that branches of the association can be found in all sections of the city and that a telephone call will bring one to the home of the sick person."

BOSTON BABY HYGIENE ASSOCIATION.—At the annual meeting of the Boston Milk and Baby Hygiene Association recently held in this city, it was voted by the corporation to change its name to the Boston Baby Hygiene Association. Dr. John Lovett Morse was elected president for the ensuing year.

THE BOSTON DISPENSARY.—The report of the one hundred and nineteenth year of the Boston Dispensary has recently appeared. It records its development during the year in the improvement of the x-ray department, the enlargement of the laboratory, the special classes for certain long-time cases of disease, the extension of the

follow-up system, the continuation of the night clinics for people of small means who cannot come in the daytime, and in the establishment of the children's preventive clinic. The x-ray department is prepared to do fluoroscopic work and extensive bismuth examinations. The staff and the management of the Dispensary has felt it greatly desirable to place this x-ray equipment at the service of those private patients of physicians who cannot afford to pay the usual fees for x-ray work at private offices of roentgenologists. There is a large number of family physicians who desire the aid of the x-ray in diagnosing some troublesome or obscure condition of one of their patients, but who find that this patient and his family are not able to afford the necessary fee. To such patients the Dispensary is glad to offer the services of the department at fees which cover the cost of the service. During the past six months the laboratory has been equipped for doing complement-fixation tests for gonorrhea. Wassermann tests were begun in 1914. The follow-up system has now been installed in all the more important clinics of the Dispensary. The three evening clinics have now established themselves as interesting and valuable adjuncts of the Dispensary. The evening genito-urinary clinic has become a large service, equal in size to the morning clinic, the average attendance on each of three evenings a week being 60 patients. The syphilis clinic has increased to an average of nearly 25 a night; and the evening eye clinic, the earliest established, is now ending its third year with an attendance of between 20 and 25 on two nights a week. A wholly new feature of 1915 was the establishment of the children's preventive clinic. In the nine months in which the clinic has been in operation, 119 children have been examined, of whom 111 have shown defects, 74 of these showing more than one defect. Regarding the investigation made by the Dispensary of the financial and social standing of its patients and its efforts to supply medical aid to those unable to pay for adequate treatment, the report states:

"Fully three-fourths of all our patients belong to family groups, and more than three-fourths of these families have but one wage-earner; 37% of families live on \$600 or less, 49% on \$700 or less, 70% on \$800 or less, 77% on \$900 or less, 83% on \$1000 or less, per annum; 3% are dependent on charitable relief; 14% have over \$1000, i.e. not more than 1400 new families a year have more than \$1000, while 8000-9000 have less than \$1000. Among those listed as unmarried, about 4000 new patients a year, 78.6% are living on \$600 or less a year, i.e. only between 700-800 unmarried applicants out of 4000 earn over \$12 a week.

"It is a general opinion among students of wage-earners' budgets that even small families in this vicinity living on \$1000 or less a year should not be expected to purchase more medical service than that necessary to childbirth

and acute illness in the home. As the use of our free district physicians shows, many families cannot meet even these emergencies. We have seldom, therefore, doubted eligibility or refused treatment at this Dispensary, unless the family income exceeded \$1000. Our rule for the unmarried wage-earner is to weigh carefully the reason for accepting when the income passes \$600."

Massachusetts Medical Society.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.

WHEREAS, The President and the Honorable Secretary of War have announced in the public press that a scheme for the reorganization of the army will be presented to Congress at its coming session, which will materially increase the military establishment, and

WHEREAS, We recall the indignant protests and criticisms of the nation at the failure to provide adequately for the sick and wounded at the beginning of the Civil War and the Spanish-American War, and

WHEREAS, It is known that this failure was due to the lack of a sufficient number of medical officers in the regular army and a means for increasing the medical establishment at the outbreak of war, and

WHEREAS, In spite of the lessons of the Spanish-American War, which were fresh in mind in the reorganization of the army in 1901, the Medical Department was not properly increased, and no provision was made for its expansion in time of emergency, and

WHEREAS, To correct the defects in the 1901 legislation, subsequent legislation was necessary in which the medical profession of the United States was called on to assist;

THEREFORE, Be it resolved by the Essex North District Medical Society, in session at Haverhill, Mass., that the Secretary of War be petitioned to make adequate provision in the reorganization of the army about to be presented to Congress, for a sufficient number of medical officers for the regular establishment, which provision should aggregate a proportion of medical officers of, at least, seventy-hundredths of one per cent. of the enlisted strength of the army, or such numbers as the Surgeon-General of the army may deem necessary, and

Be it further resolved that the Secretary be petitioned to make provision in this reorganization for the expansion of the Medical Department at the beginning of war, by calling into service in the Medical Reserve Corps physicians from civil life who have been instructed in their special duties as medical officers in our summer

campus, and otherwise as the War Department may see fit.

J. FORREST BURNHAM,
Lawrence, Mass., March 20, 1916. *Secretary.*

Obituary.

WILLIAM PALMER BOLLES, M.D.

DR. WILLIAM PALMER BOLLES died at Santa Barbara, Calif., March 18, 1916, aged 70 years. Dr. Bolles was a practitioner of Roxbury, Boston, for forty years. He was born in New London, Conn., June 14, 1845, and was a graduate of the Harvard Medical School in 1871, serving as a house officer at the Boston City Hospital and soon becoming surgeon to out-patients and surgeon to that institution. Here he served until he was retired at the age limit, in 1908, becoming surgeon emeritus. He was professor of materia medica and botany in the Massachusetts College of Pharmacy from 1874 to 1884, and instructor in materia medica and therapeutics in the Harvard Medical School from 1880 to 1884. He joined the Massachusetts Medical Society in 1871, was a councillor from 1890 to 1893, and was retired in 1913. He was a member of the American Medical Association, of the Boston Society for Medical Improvement, of the Dorchester Medical Club, of the New England Historical and Genealogical Society, and a life member of the Boston Medical Library. He is survived by his widow, who was Miss Martha B. Sumner of Boston.

Miscellany.

MEMORIAL RESOLUTION FOR DOCTOR ROWE.

At a meeting of the Boston Society of Psychiatry and Neurology, March 16, 1916, the following memorial was read:—

George Howard Malcolm Rowe died at his home in Boston, January 30, 1916, after an illness of several years. He was born in Lowell, February 1, 1841, was graduated from Dartmouth College in 1864 and from the Harvard Medical School in 1869. After a year in the Pennsylvania Hospital for the Insane, he accepted a position in what was then called the Boston Lunatic Hospital, where he remained till he was called to the superintendency of the Boston City Hospital in 1879. While in the Lunatic Hospital he showed an ability for work and a thoroughness, which later contributed much to

his success in what proved to be his life work in the City Hospital. He also developed a love for the field of psychiatry which he never lost, but which he was unable to follow into its more recent advances owing to the pressure of work in hospital administration.

As Superintendent and Resident Physician of the Boston City Hospital, he followed Dr. Edward Cowles in the work he had so admirably begun, and brought the Hospital to an enviable position among the hospitals of the country. He was deeply interested in all problems connected with medicine, especially in hospital construction and administration, in both of which he excelled. During his administration the Hospital increased greatly in size and equipment, keeping fully abreast of the times. This was largely due to the confidence won by Dr. Rowe from his trustees, the city government and the public. He was the soul of honor, indefatigable in work and with an ability for detail which was remarkable. After nearly thirty years of faithful and arduous service he was obliged to resign his position as Superintendent on account of sickness and failing strength. The remaining years of his life were passed quietly in the companionship of a most devoted sister.

He was a charter member of this Society, a member of the American Medical Association, American Health Association, Association of Hospital Superintendents, of which he was at one time president, American Medico-Psychological Association, and various other medical, philanthropic and social societies. He organized the Hospital Round-table, the object of which was to bring together the superintendents of the various hospitals for the informal discussion of the problems and difficulties connected with hospital management.

RESOLVED, That the Boston Society of Psychiatry and Neurology place on record its appreciation of the character of Dr. Rowe and of the great work he accomplished.

RESOLVED, That a copy of this resolution be sent to Miss Rowe, be spread on the records of the Society and be published in the BOSTON MEDICAL AND SURGICAL JOURNAL.

CHARLES G. DEWEY.
E. V. SCRIBNER.

Correspondence.

AMERICAN ASSOCIATION OF GENERAL PRACTITIONERS.

BOSTON, March 15, 1916.

Mr. Editor: Regarding the forming of an Association of General Practitioners as suggested by Dr. Sanborn in this week's JOURNAL, I agree that something should be done in this line.

The plight of the ordinary doctor in the near future will be an unenviable one, if the widespread propaganda by the hospitals, specialists and social workers,

bear fruit. Their chief aim seems to be to discredit the ordinary physician in the eyes of the public.

One missionary says "Massachusetts is a dumping ground for incompetent doctors." Another says "Only the very rich, who can afford specialists, and the very poor who go to the hospitals, get proper treatment in Boston." All the lesser lights take their cue from these "leaders".

In the "Baby Week" addresses, the hospital idea was as usual emphasized. The women were advised to go to the hospital for examination when pregnant, and when the baby was sick the child must be brought to the out-patient clinic. The point was brought out that the hospital was the proper and only place for the pregnant woman during childbirth.

The "follow-up" method of the social workers, as outlined in a recent article in the JOURNAL, the object of which is too plain to disguise, is a disgrace to the profession and savors only of quackery.

The unfortunate part of this booming of hospitals and their attachés, is that the poor are crowded out by well-to-do middle class people. The out-patient departments should be for the sick poor, and they should get first-class treatment, but as matters go now, fifty people attend a clinic, when only five or ten people have a right to be there: the result, all get slipshod treatment, and the unfortunates who have a right there, are shamefully neglected.

A Roxbury physician tells me that he has lost seventy-five per cent. of his office patients since the establishment of a hospital nearby, dedicated by the founder to the use of the sick poor, but used by sick rich (who are encouraged to use it, by the leaders of the profession), as usual, crowding out those whom the hospital was intended for by the founder.

We do need an association of general practitioners, but what of the Massachusetts Medical Society? Why is nothing done for the material interests of the profession? The answer is plain: specialists on every committee; men who make ten to fifty thousand a year. The interest of the man who makes a thousand dollars a year or less, concerns them not. Either elect men who are in sympathy with the profession at large, or if this is impossible, by all means let us form a society to protect the elementary rights of the profession.

CHARLES MALONE, M.D.

5 Glen Road, Jamaica Plain, Mass.

THE PROPOSED AMERICAN ASSOCIATION OF GENERAL PRACTITIONERS.

BUFFALO, N. Y., March 16, 1916.

Mr. Editor: With all due respect, I beg to present the opposite argument to the proposal of Dr. Edwin A. Sanborn of Somerville. While a specialist, my ultimate view-point is not essentially different from that of the average general practitioner.

1. Any subdivision of the medical profession weakens the *esprit de corps* and the general influence of the profession. While the specialist, or the general practitioner for intensive study, may require organizations of limited scope, he should also be in active affiliation with medical organizations of general nature.

2. Every advance made along any special line of study is potentially, if not immediately, available for other apparently widely different lines of practice and, *a fortiori*, for general practice. Conversely, it is only in organizations based on the needs of the general practitioner that scientific advances can be properly correlated and subjected to ultimate practical testing and modification. Simply as illustrations of the necessity of keeping specialists in touch with general medicine, I may mention that the American Gastro-enterologic Association has always opened its doors to surgeons, pathologists, physiologists and general practitioners and has often presented programs on which gastro-enterology in the limited sense, was in the minority. I find it necessary to attend meetings of

general nature and, indeed, get the most valuable hints for special application from them. Often a subject apparently most remote from my work, yields very practical information for use in a limited field. For example, I have occasionally applied gonococcal vaccines to the treatment of gastric neuroses, especially hyperchlorhydria and I obtained valuable hints from a paper on sacro-iliac disease which I heard simply because of the desire to be present as a physician, at a meeting of general practitioners. The most dangerous specialist, especially if his practice is along surgical lines, is the one who is not also, at heart and in his medical interests, a general practitioner.

3. There already exists a large, influential and well-organized system of professional societies, the membership in which consists of general practitioners, in an overwhelming majority. In most communities of considerable medical population, this system is duplicated by independent associations, of which the same is true. On the one hand, why shut specialists from these organizations or, on the other hand, why create a rival organization on similar exclusive lines?

4. The argument that the general practitioner understands his patient better than the stranger does not by any means imply that he is equipped or competent to perform some special feat for that patient. It not infrequently happens that a patient may be under the care of some one surgeon, oculist, dentist, or other specialist for a long term of years, but that does not render the specialist competent to undertake the care of a different condition with which he is not conversant.

5. As to the contention that the physician should not be handicapped with regard to dispensing medicines; the specialist must agree since, for a less extensive range of armamentarium, it is even more necessary that he should be thus equipped. That, for complicated prescriptions, not required for immediate use, a pharmaceutical specialist should be employed whenever practical, seems to be sound sense as well as good ethics.

6. The criticism as to hospital management applies as much to specialists as to general practitioners. Certain general practitioners exploit the close-service method as much as specialists, and the converse also holds good. A publicly-supported institution should be public all the way through.

7. Retrieving methods are, according to my observation, likely to prove retroactive. They are not entirely confined to specialists. The conception of ownership of a patient seems to be rather a mark of general practice than of specialism and while this is, in a sense, proper, failure to recognize the right of choice by a patient is always liable to produce bad feeling and is sometimes carried to a ridiculous extreme. For example, a specialist, who was asked to take care of a labor case, declined on account of limitation of practice, and referred the family to a young general practitioner. Some months later, the specialist was consulted for a condition properly included in his specialty and affecting the baby which had not had any medical attendance since the puerperium, during which time it was presumably under the care of the doctor who delivered it. The latter promptly accused the specialist of stealing the case. I have personally been embarrassed in several consultation and reference cases by having another physician claim sole jurisdiction by virtue of prior attendance. In almost all of these instances, matters have been amicably settled, but some have presented such a confusing mass of claims that they were difficult to adjust satisfactorily to all. In one case, I was made party to a homicide, being consulted by a general practitioner and advising operation. Some time later, I was invited to be present at the operation which was attempted by the physician himself. He became confused, lay down, and the interne and myself were compelled to do what we could to get the patient off the table alive, although totally unprepared and unqualified. In these days of frequent changes of residence, lay independence and sub-

division of practice, it seems to me that the only satisfactory solution of these ethical problems is for every practitioner, without regard to his kind of practice, to grant practically the right of choice which theoretically belongs to the laity and to which they have a legal right. This contention is made, not on the ground that the specialist, by surrendering the advantage of extension of one case to another of different kind, has the right to take what comes to him in his particular field but because if the specialist attempts to subordinate himself to the claims of the family physician, he is so often in a quandary as to which particular family physician has the paramount claim. Even considered judicially, this is really a difficult task. When it comes to a practical decision seeking to reconcile all claims, including the patient's desires and welfare, it is still more difficult.

8. What is most needed at present is to reduce medical societies instead of organizing new ones; to emphasize the community of interest of the medical profession instead of magnifying differences; to correct such evils as may exist through the machinery of existing organizations.

A. L. BENEDICT, M.D.,

Editor of the Buffalo Medical Journal.

USE OF BACTERINS IN DERMATOLOGY.

BOSTON, MASS., March 16, 1916.

Mr. Editor: In the issue of the JOURNAL of Jan. 13, 1916, under "Correspondence" there is a letter by Dr. Charles J. White on the "Use of Bacterins in Dermatology," which, I believe, should not go unanswered. His reference to the "ability to succeed in the making and administering of bacterins" being a "gift of the gods," I believe, needs an explanation.

Bacterial vaccines in medicine are too important and valuable a therapeutic agent in a variety of diseases and most especially in dermatology to be abandoned as a "field defeated," and the setting down that its success depends upon a special "gift of the gods." Success in therapeutic immunization or the successful use of bacterins in dermatology or any other disease is in my experience not a matter of the "gift of the gods" but rather a question as to how much time one cares to devote to it.

The preparation of the proper autogenous vaccines presupposes a knowledge of bacteriology. The proper understanding and interpretation of the reactions following the administration of vaccines and the gauging of subsequent dosage depends upon the amount of knowledge of immunology one possesses. Upon both the foregoing depends the success in this method of treatment. It goes without saying that a busy specialist in any of the clinical branches of medicine with very little knowledge, if any, of bacteriology could hardly expect to obtain successful results with vaccines, particularly if he would depend upon "stock" vaccines, half-heartedly administered. The reason that men specially appointed and paid to do vaccine therapy in some hospitals fail is, I believe, due to lack of interest these men take in the work to which they are supposed to devote their whole time.

Instead of constantly applying themselves to the preparation of the proper autogenous vaccines, study, and establishing their effects in a variety of diseases, as they have the possibilities of doing, and not waiting for a young house-physician from Kansas City to come and show them what can be done with vaccines; instead of studying the therapeutic application experimentally on animals on those infections in which vaccines have as yet not been demonstrated by other observers to be of value; instead, in fine of applying themselves to the work which they are supposed to do whole-heartedly, they wander off in all kinds of directions, as the studying of the rôle played by the diphtheroid bacillus in Hodgkin's disease, or they become syphilologists and devote their time to

salvarsanized serums, etc., all of which is no doubt highly commendable and excusable in private practice and of value in their own fields, but what relation are they to vaccine therapy in public institutions?

The great pity of it all is that the big lights in the profession in the various branches of medicine, who owing to their standing, are looked up to as guideposts by the medical men as well as the laity, the consultants and the heads of the big clinics—these men, basing their opinions upon the failures of such so-called vaccine work, are actually misleading others and depriving the sufferers of what might result in a cure in a variety of diseases due to bacterial infections.

A virile man at the head of a vaccine therapy department (Therapeutic Immunization Department) could accomplish an immense amount by having the house officers in the various departments prepare the proper vaccines for the patients in their respective clinics, under his direction, and administer such vaccines under his guidance. The house officers would thus gain a great deal of knowledge of practical bacteriology and familiarize themselves with therapeutic immunization. The work, if carried out in this way, would reduce materially the percentage of failures in a considerable number of diseases due to bacterial infections and would relieve a great deal of unnecessary suffering in such patients. It would cut short the length of time of the patients' stay in the hospital, which is quite an economic consideration in any big institution. The field is big and the possibilities for good are immense, if handled properly.

This is not intended as a personal criticism of anyone. It is meant in the spirit of a wholesome criticism of a prevailing method of doing things, which in my opinion, has a tendency to be a factor for bad rather than for good. I do not believe that this letter will change matters to a great extent, but at least I feel that I have done what I think it my duty and obligation under the circumstances to do.

LEON S. MEDALIA, M.D.

483 Beacon Street.

SOCIETY NOTICES.

PETER BENT BRIGHAM HOSPITAL.—There will be a Medical Meeting in the amphitheatre of the Peter Bent Brigham Hospital on Tuesday evening, April 18, at 8.15 o'clock.

PROGRAM.

1. Demonstration of cases.
2. Ochronosis and Alkaptonuria.
3. The Use of Fibrin Paper and Forms in Surgery.
4. Renal Function in Pernicious Anemia.

Dr. Henry A. Christian.

Medical students and physicians are cordially invited. Telephone Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the Hospital.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.—The Annual Meeting of the Society will be held at the American House, Boston, on Wednesday, April 19, 1916, at 11.00 A.M. The annual oration will be delivered at 12.00 o'clock, noon, by Dr. Charles F. Painter of Newton. Subject: "Preparedness for the Study of Medicine."

Dinner will be served at 1.00 P.M.

LYMAN S. HAPGOOD, M.D., Secretary.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-fourth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, April 28, 1916, at 8.15 P.M.

The following papers will be read:—

1. Some Phases of the Recent Epidemic of "Acidosis."

P. H. Sylvester, M.D., Newton.

2. Pulmonary Tuberculosis: A Study of its Occurrence Amongst the Children of Infected Families.

H. I. Bowditch, M.D., Boston.

3. The Treatment of Tuberculosis in Infancy.

W. W. Howell, M.D., Boston.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., President.

RICHARD M. SMITH, M.D., Secretary.

RECENT DEATHS.

DR. THOMAS HUGH O'CONNOR, a medical inspector of the Board of Health, died at his home in Roxbury, March 30, 1916, aged fifty-nine years. Dr. O'Connor was born at Milford, N. H., December 21, 1856, attended the schools of that town, and then was graduated from the College of Physicians and Surgeons, Baltimore, in 1893. After serving as house officer in the Baltimore City Hospital for a year, he settled in Boston, with an office on Tremont Street. He had been school physician and police physician besides being an inspector for the Boston Board of Health. He was a Fellow of the Massachusetts Medical Society, of the Boston Medical Library, a member of the Boston Lodge of Elks, of the Catholic Union and of the Charitable Irish Society. His death was due to a fall on the ice, causing fracture of the skull and cerebral hemorrhage. He is survived by his widow, who was Miss Rose Terrell, and by two daughters.

DR. FRANCIS ABELE, JR., who died on March 26 at Quincy, Mass., was born in Roxbury, Mass., on October 25, 1868. After graduating in 1886 from the State Normal School at Bridgewater, he taught for a time and then entering McGill University at Montreal, received from that institution the degree of doctor of veterinary medicine. He began practice at first in western Pennsylvania but later went to Milford, Mass., and in 1895 to Quincy. Since 1899 he had been an inspector of animals and an officer in the National Association of Veterinary Surgeons. He was also a member of the Massachusetts Veterinary Association and a district officer of the Massachusetts State Board of Health. He is survived by his widow and by two sons.

DR. J. EDWARD AUSTIN, who died on March 29 at New Bedford, Mass., had been for more than twenty years a physician in the government service of Costa Rica and Honduras, where he had charge of medical inspection and sanitation. After receiving his degree from the University of Columbia, Dr. Austin engaged in the special study of tropical disease. He achieved a distinguished reputation by overcoming and controlling yellow fever, first in Costa Rica and later in Honduras, where he accomplished all that was done by the United States in Cuba and Porto Rico. He also developed in Honduras an extensive private practice and resided there during the greater part of his active career. He is survived by his widow.

DR. LYDIA MARIA HOLMES, who died recently at Arlington, Mass., was born in Fort Lee, N. J., February 11, 1828. She obtained the degree of M.D. in 1868 and had subsequently practised as a physician in Concord and Needham, Mass.

DR. ORIN WARREN, a retired Fellow of the Massachusetts Medical Society, died at his home in West Newbury, Mass., April 6, aged 83 years. He was born in Fryeburg, Me., in 1833, was graduated from the Jefferson Medical College in 1858 and was a veteran of the Civil War. He leaves his widow and one daughter.

DR. GEORGE A. FAGAN, of North Adams, Mass., who died at Troy, N. Y., on April 1, was born at North Adams in 1871. After graduating from Holy Cross College, he received the degree of M.D. from McGill University in 1898. He immediately settled in practice at North Adams and was for two years chairman of the local board of health.

The Boston Medical and Surgical Journal

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Original Articles.

CONFERENCE OF MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.

(Series continued from page 531.)

IV.

PREVENTABLE FORMS OF MENTAL DISEASE AND HOW TO PREVENT THEM.*

By E. STANLEY ABBOT, M.D., WAVERLEY, MASS.

Clinical Assistant and Pathologist, McLean Hospital, Waverley, Mass.

INSANITY is widespread. At the time of the last national census (1910) there were more insane in hospitals than there were students in the colleges and universities of the country.

The cost of caring for them was nearly \$33,000,000 a year. The economic loss due to their being unable to work was estimated at more than \$130,000,000 annually—the total cost of insanity being equal to the value of the combined annual exports of wheat, corn, tobacco and dairy and beef products, nearly \$163,000,000.

In Massachusetts last fall (*i.e.*, Oct. 1, 1914) there were over 15,000 (15,066) insane persons in public or private hospitals or on temporary leave from them. There may be some 3,000 to 4,000 milder cases taken care of at home. Over 4,000 cases were admitted to hospitals during the preceding year. That year (1914) the cost to the State for care of the insane and upkeep

and improvements of the buildings was nearly four and a half million dollars (\$4,468,291.31), about a seventh of the total State expenditures. The cost of care in the private hospitals was probably in the vicinity of half a million dollars for the same period.

Thus insanity costs citizens of this State between four and five million dollars a year for care alone; if to that is added the loss due to unemployment on account of it, the sum would reach eighteen or nineteen million dollars.

These figures do not include the feeble-minded, of whom it is estimated that there are over 14,000 in this State, and of whom the State takes care of only about 2,500, at a cost of nearly two-thirds of a million dollars. Nor do they include the inebriates and epileptics, about whom I shall say little or nothing.

Cannot we prevent some of this great loss, to say nothing of the distress that inevitably accompanies it and its cause.

If we are going to prevent insanity, we must know its causes and why people are subjected to them. Then we can know what to work at, and how to work.

There are many different forms of mental disease, or psychoses, as we call them, but for the purposes of this paper they can be put into a few great groups. We shall see that some forms are wholly, some partly, and some not at all, preventable in the present state of our knowledge.

The great groups of psychoses are:—

1. That due to defective mental development—the feeble-minded.
2. Dementia praecox.

* Address prepared as part of the educational propaganda of the Massachusetts Society for Mental Hygiene, and read in whole or in part before lay audiences.

3. The manic-depressive psychoses.
4. The psychoses due to destructive diseases of the brain.
5. The toxic psychoses, and
6. A more or less heterogeneous group.

Feeble-Mindedness.

I. The largest group is that due to developmental defects, showing all grades of feeble-mindedness from the idiot and imbecile to the moron and the so-called psychopathically inferior person, or psychopath; both of the latter might pass in a crowd for normal, and they furnish a large proportion of the so-called white slave class and of the defective delinquents who contribute largely to the population of our reformatories and prisons.

Dr. Walter E. Fernald has said and written so much and so eloquently of the needs of this great group, that I will say only a few words about the prevention.

Head injuries during birth or in infancy and childhood, acute inflammations of the brain, or its coverings, and certain rare bodily diseases are responsible for a small proportion of cases. Marked fatigue, illness or physical exhaustion of one or both parents at the time of conception may be a cause of imperfect development of the child. Alcoholism and venereal disease, especially syphilis, in one or both parents, are undoubtedly causes of no inconsiderable amount of feeble-mindedness in the offspring.

Eugenics would require that the parents be well, unfatigued, and free from alcoholism at the time of conception.

By far the largest number (probably 80%) of feeble-minded persons have inherited the defect from one or both parents or grandparents. Feeble-mindedness in the parents is the chief cause of feeble-mindedness in the child. To prevent it in children, matings of defective persons must be prevented, for such persons have little or no sense of responsibility, and are prolific, and many of the children procreated by and born to them are born out of wedlock. Sterilization by one method or another has been advocated, but by far the best and most effective prevention is segregation in schools and colonies for the feeble-minded, especially of the moron girls and women during the period when they are capable of bearing children.

I speak of segregating the women especially, because the male defective is of comparatively little menace to society in this particular respect.

In order that proper segregation may be accomplished in this state, new schools and colonies need to be established or the present ones greatly enlarged. The former is the better plan. The present schools are over-crowded and inadequate to take all who should go there. It is largely a matter of legislation and expense. If every parent who has a feeble-minded child which cannot be admitted to the existing schools

for lack of room should talk to the representative of his district, not to try to get the child admitted through political pull, but to urge the necessary legislation and appropriation, the amount of such pressure would be so great that the legislators would feel obliged to take suitable action. It is not sufficient that the organizations interested in the matter should talk about it and urge it; it needs the local push on the representative of the district, by the voter in the district, as well.

Insanity.

The rest of the psychoses which I shall take up are mental diseases which occur in persons who were previously normal.

II. *Dementia Praecox*. Of the patients admitted to the hospitals for the insane, nearly a quarter (about 24%) are cases of what we call dementia praecox. It is a form of insanity which comes on in the earlier years of life, usually between the ages of adolescence and 30 or 35; in general it is characterized by the tendency of the patient to withdraw into himself, avoid contacts with the world about him, and give himself up to day dreams about which he is reticent. He is resentful of efforts to draw him out. There are, of course, a good many different manifestations of the illness, and this description is only a very general one, to which there are many seeming exceptions. The patient early becomes more or less demented, incapable of taking his normal place in life, though sometimes capable of routine work under direction, but on a lower level than his former one. Usually he needs hospital care for life, and as he is likely to live as long as he would have if he hadn't become ill, if not longer, cases of this kind accumulate in the hospitals faster than they can be discharged. Thus they make up a large part of the hospital population, and also they make it necessary to provide hospital accommodations more rapidly in proportion to the growth of general population, with the result that insanity appears to be increasing in the community faster than it really is.

In spite of its frequency, we know very little really about the causes of dementia praecox, and hence we do not know where to aim our efforts to prevent it. There are different theories, most of them, thus far, unconfirmed. Some think that there is an actual disease of some portion of the brain substance; others that there is faulty action of some of the glands of internal secretion, as they are called, especially the thyroid and sex glands; still others that emotional states may interfere with the proper working of these glands. But it is all vague, indefinite, quite unproved, and gives us little at present on which to work for prevention.

Another theory lays stress on mental factors as causes, regarding the mental symptoms as outgrowths from and developments of faulty ways of meeting difficulties, shown even early in childhood. This theory is based largely on the

fact that a very much larger number of dementia praecox cases than of the other psychoses give a history of showing these faulty habits of adjustment. So it is thought that children with a type of make-up in which these ways are prominent are more likely than others to develop dementia praecox in later years. I cannot help thinking that this make-up, which I shall presently describe, is inadequate to account wholly for the disease, but in a fairly large proportion of cases it may be one of the important contributing factors.

If this theory be true, or partly true, an indefinite number of persons may be prevented from developing dementia praecox, and certainly they will lead happier, more efficient lives, if they can be taught in childhood and youth to adopt more healthy attitudes toward life. The normal child plays happily or even aggressively with others, occupies itself with concrete and objective things and interests, takes the knocks and disappointments of life casually and without prolonged rancor, confides freely and openly with parents and companions, and happily substitutes another occupation for one that is forbidden or at the time unavailable or inadvisable. If, instead of this, a child keeps by itself; does not seem able to get on common ground with other children; gets absorbed in its own day dreams and fancies and resents being called out of them; is sensitive and takes knocks and disappointments as slurs or injustices, resents them, broods over them and regards itself as a martyr; nurses its grievances in its own breast, not confiding its troubles to others but continuing the sense of injury and injustice; in general keeps its thoughts to itself; and when its chosen occupation is denied it, goes off by itself with a sense of injury and does not try to take up another, but lets the mind dwell on unproductive fancies and vague, impractical aspirations—such a child is more likely than the others to have dementia praecox.

We all of us have some of these, and other similar tendencies, mixed with the more frank outspoken and objective ones. It is rather when a person has so many of them as to dominate the personality, make it noticeably different from the average—so that we are apt, without defining just why, to say that the child or person is "odd" or "queer" or "different from the others"—that these traits may become the foundation of dementia praecox.

The best way we know to prevent this psychosis is for parents and teachers to begin at the first appearance of these traits, perhaps even as early as infancy, and to continue till adult life, to make unremitting, tactful and sympathetic efforts to get into the little mind, to understand its point of view, to suggest happier and healthier ones, to lead the child to more objective and so more healthful contacts and interests, to teach more practical substitutions and aims, better ways of reacting and better attitudes

toward persons and life. It must be remembered that these better ways cannot be imposed upon the child from without, but the seed must be planted and must grow from within, if the reformation is to be accomplished, and the faulty habits of adjustment are to be overcome. What proportion of cases can be thus prevented we have as yet no means of knowing.

III. *Manic-depressive psychoses.* Probably from a sixth to a fifth (16-20%) of the yearly admissions to the hospitals for the insane are due to breakdowns in persons who were unable to withstand the hard continuous work, or the exhaustion of illness and pain, or the sudden and intense or the long continued stress of conflicts between opposing desires, ambitions and duties, or the strain of prolonged responsibility, or the various combinations of these that life held for them.

Most of these cases we class under the manic-depressive psychoses—the old-fashioned mania, melancholia and circular insanity. Some of these and a great many other cases, milder than those who need hospital care, are often called nervous prostration, neurasthenia, psychasthenia, and psychoneurosis. The great majority of patients ill with these psychoses get completely well of the attack, but many are liable to recurrences under unfavorable conditions. Any given attack may last only a few weeks, or it may be prolonged even for several years, yet with eventual recovery.

The causes of this lack of endurance, and hence these attacks, are to be found partly in the bodies and tendencies we inherit from our ancestors. But age has its effect—we cannot lead such strenuous lives after 50 as we could in youth. And physical illnesses and unwise habits of living will increase our fatigability, and lessen our capacity to stand stress and strain.

Personally I always think of these forms of mental disease as *fatigue* psychoses, and treat them on that basis, not only because they begin with the manifestations of ordinary normal tire, such as we all experience, but because the symptoms seem to be developments, exaggerations, and consequences of the same manifestations. I do this in spite of the fact that in a certain proportion of cases the fatiguing factors are difficult to discover; that in many cases the attacks come on in spite of efforts to secure the best living conditions for the patient; and that in many the attack seems to run its course regardless of all we know how to do to shorten it.

I use the word *fatigue* in a broad sense, to include not only the effects of long hours or of hard physical or mental work, but those of enduring long continued nagging pain or physical discomfort, of the weakness accompanying or following illnesses or surgical operations or childbirth, and also the effects of carrying responsibility, of suffering great griefs or anxieties, or of enduring the great disappointments, the internal conflicts between duties and desires,

the thwarting of deeply cherished hopes and ambitions. These have a wearing effect on us, "take something out of" us, lessen our working energies, and produce results much like those of normal mental fatigue.

Just as we differ from one another in form and feature and in personality, so we differ somewhat in the ways in which we show normal as well as pathological fatigue. When we are tired we cannot think as well or as quickly or as long on any one topic, our judgment is not so good, we cannot see so many sides to the matter we are trying to consider; but in some of us thoughts come up slowly and with difficulty, with others they crowd and rush in great profusion; in some of us decisions are hard to make, while others make quick but superficial plans, decisions and judgments. But we all work less accurately, and less effectively. Some of us find it hard to keep ourselves at work just because everything is an effort, others because we are easily distracted and so go aimlessly from one thing to another; some of us move and think slowly, others in a quick, nervous, tense way. Some of us feel unequal to doing things, feel sober, glum, even depressed, cautious, apprehensive; others feel reckless, laugh easily, "get the sillies," make puns or poor jokes. We lose control of our emotions, and get irritable or angry or laugh inordinately at trivial things. Some of us feel tired and languid, want to rest and be let alone, don't take so much interest in things going on about us, while others of us want to be doing something all the time, or feel that we must keep at our task and put it through, though we accomplish little, or work "on our nerves," as it is often popularly expressed. We are apt to forget daily or customary things, and find it harder to memorize things and to recall things, such as names. Some of us have feelings of tightness or tension in the head, or headache. Some get sleepy, others wakeful, and when awake keep going over and over the same problem without reaching conclusions. Some of us, if we sleep, dream of being in difficulties and of everything going wrong in trying to get out of them. The appetite is not so good, there is apt to be a sense of being filled up, the bowels are sluggish, the respirations are shallower, the heart is more rapid, even to giving a feeling of palpitation, the head feels hot, and the feet and hands cold.

These are the chief effects of fatigue,—there are infinite variations, combinations and modifications of them. We do not all have all of them, and each of us has at one time some, at another time others.

The fatigue psychoses begin with some of these manifestations, and, if the conditions which cause the fatigue persist, the symptoms grow worse and develop into the depressions, the excitements, or the stuporous and sometimes delirious and delusional states of the manic-depressive psychoses.

Why do people get over-tired?

Because they don't get rest enough.

But why don't they do that?

Sometimes they cannot, because with small incomes and large families the work *must* be done and there is no one else to do it, or they have to support others, or a sudden business reverse or other misfortune has befallen them, so that they have to keep at work, or they have to stand domestic strains which they cannot escape. But more often they *only think* they cannot stop to rest,—when the actual breakdown comes they have to stop, and it would have been no harder and much more economical of time and money if they had stopped before the breakdown. Often people deceive themselves, thinking they will find a more convenient time to rest by and by, but they rarely do; or they think they can stand the work a little longer, or that they have always been well and can't break down. Boys and girls in school and college are sometimes ambitious, or their parents and teachers are ambitious for them, and they over-work and under-rest. Often people do not know when they are tired, not recognizing the significance of the way they feel. And some, who fatigue easily, though they may look the picture of health, are goaded and shamed by their friends or by their New England consciences into over-doing.

Let me quote a true statement from a trade journal on "Going to Bed Tired."

"What used to be thought a virtue turns out to be one of mankind's worst vices—the habit of working beyond the fatigue point. Many men and women still pride themselves on being dreadfully tired when bed-time comes; they ought in reality to be ashamed of themselves. It is one thing—and a good thing—to work hard and systematically during regular hours. It is a crime against one's own life—and in the case of young women, against the lives of the next generation—to work or play so as to be persistently tired. Just when the fatigue point is reached varies among individuals, and often in the same individual according as he is well or ill fed and slept. In general, however, it is now realized by most employers that even from their narrow outlook of profits, overworked employees are unprofitable.

"Sooner or later, this truth must be learned by housekeeping women."

This applies to the housekeeping woman herself as much as to the maid. Among other reasons why they don't get rest enough are some erroneous ideas. Change of occupation is thought to rest one, but it only tires one the more, though the interest of it may hide the fatigue. Our ordinary recreations—they should be called diversions, not recreations, for they do not recreate us—are fatiguing, though again the enjoyment at the time hides the fact; and we are apt to attribute the fatigue we feel after the

diversion wholly to the previous fatigue, when in reality part of it was due to the diversion itself. One never feels like settling down to hard work right after the usual so-called recreations.

It uses up energy—tires us—to read a book or newspaper, to study, to work at a problem, to keep books, to take part in social life where one has to respond to the person with whom one is conversing, to listen attentively to a lecture, to watch a play at the theatre, or a ball game, or the movies, to feel responsibility, to feel sorrow or enjoyment, etc. Everything we do requires energy.

We cannot avoid getting tired, but we can almost always avoid getting *too* tired. When tired, we must do less, that is, expend less energy per day. And we must eat more—for all our energy comes from the food we eat and the air we breathe. Now we can't breathe much more air, but we can eat more.

When we are tired we are usually less hungry. One erroneous idea is that food won't digest if you don't have appetite for it. It may take longer, but it will digest and yield up its energy—if you eat it. It certainly won't if you don't. So give it the chance.

Another mistaken idea is that if one is wakeful one should read or take exercise in order to "get tired enough to sleep." In most cases one is wakeful because one is already too tired to sleep. One should not, then, expect to benefit (though one may get sleepy) by adding to one's fatigue. It is better to lie quietly with the eyes closed in bed in a dark room and wait for sleep to come. One will then at least be resting, if not sleeping. Of course, we rest best if we sleep, because then we are using up the least amount of energy, but even if we don't sleep, if we spend as little energy as possible we may still get rested, though not so fast.

We are apt to forget that in late youth and early middle age our machinery begins to be less completely and quickly repaired; that, therefore, we fatigue easier and take longer to get rested, and that we need to conserve our energies, to spend them less lavishly. It is a good rule to so order one's life that one *takes enough time for rest each night to fully make up for the wear and tear of the previous day.* A few rare creatures like Napoleon and Edison can perhaps keep on with only three or four hours' sleep out of the twenty-four, but the vast majority of us would come to grief if we tried it. The average person needs at least seven or eight hours' rest daily. I myself need nine to keep up to my best efficiency.

Perhaps a half, possibly more, of the manic-depressive psychoses might be prevented if everyone, especially those who tire easily, and those who have already had one breakdown, would take pains in the first place to learn what things cause fatigue; if, in the second place, they would recognize early that such symptoms as I have mentioned probably mean fatigue; if, in the third place, they would realize that persistence in the fatiguing conditions and conduct

may mean a breakdown; if, in the fourth place, they would recognize that the cure of fatigue is *rest and food*, not more or different activity; and if, in the fifth place, the tired person would not think himself an exception to the general rule, but would apply to his own case the principles that he can see would apply to anyone else.

We need to remember, too, that fatigue is cumulative, that it piles up, or rather that our reservoir of energy will get slowly exhausted if we do not add daily as much as we daily remove or use up. It may take months or years to reduce the store to the point of a breakdown. It may take as long to re-accumulate enough to live on.

Besides this, if each person, and especially those who have already had one or more breakdowns would realize that his endurance is limited, would find its limits, and would keep within them, applying to himself the knowledge that he has, far fewer manic-depressive patients would be admitted to our hospitals, and there would be far less "nervous prostration."

IV. *Organic brain disease.* Almost another quarter of the patients admitted in this state have psychoses due to one form or another of well-known brain disease, with destruction of brain tissue. The patients lose their minds more and more completely, and either become totally demented or die of some physical illness before the dementia is complete.

Some two-thirds of this group, or about 16% of all admissions are due to the brain-cell changes of old age, to cerebral arteriosclerosis (that is, so-called hardening of the arteries of the brain), or to a combination of the two; and a small number to brain tumors, head injuries, etc.

We do not know why the pure senile changes occur at all, much less why they appear in one person at 65 or 70, and do not appear in another even at 90 or 100. It may be that a placid, temperate life is more conducive to mental longevity than the reverse, though there are plenty of examples of nonagenarians who have lived hard, strenuous, eventful lives without evident diminution of mental vigor—as, for example, Lord Stratheona and Mount Royal, who thought nothing of going to Europe on business at 93. So we don't know how to prevent pure senility.

Many causes are given for the occurrence of arteriosclerosis, some physical, some mental. Among the physical causes are said to be the habitual use of alcohol, either in moderate or intemperate amounts—this has been denied by some; in reality, we do not know. High living and over eating, especially of condiments and highly seasoned foods, are thought to be causes. And recently an old infection by a germ, the *Treponema pallidum*, has been thought to give rise to it in some cases—it is not yet proved. For mental causes, a too strenuous life and long continued anxieties and worries are thought to be effective. To prevent or postpone, therefore, a cerebral arteriosclerosis with its possible con-

sequences, one needs to live from the beginning a temperate, moderate life, in accordance with the best moral and hygienic rules that we know. If there are evidences of arteriosclerosis in other parts of the body, careful dieting and modification of the daily routine of life under the direction of the physician and as much freedom from worry and anxiety as it is possible to attain will contribute as much as anything we know to the postponement or prevention of its possible extension to the brain.

A third of the psychoses due to organic brain disease, or between 8% and 9% (8.3%) of all admissions (289 last year) are called general paralysis of the insane, general paresis, softening of the brain, paralytic dementia. Senile and arteriosclerotic psychoses are also sometimes called softening of the brain, though due to an entirely different cause.

It is now known that infection by the *Treponema pallidum*, or germ of the venereal disease syphilis, is the chief cause of general paralysis, though often indulgence in alcohol and complicated and strenuous living are contributing factors. Also some races seem to be more liable to paresis than others, and undoubtedly a smaller proportion of infected women have it than of men, for not every person who is infected with the *Treponema* has paresis.* It is far more frequent in men than in women. In different countries and in different walks of life the amount probably differs, but no civilized country and no walk of life is exempt. More persons die of paresis in New York City than die of typhoid fever. But in spite of the contributing factors and modifiers, it is a true saying that there is no general paralysis without an antecedent syphilis.

Thus the problem of prevention of paresis becomes a part of the larger problem of the prevention of syphilis, as the latter is a part of the problems of prevention of all venereal diseases and of social and moral hygiene. It is closely linked with the problems of the prevention of feeble-mindedness, with the control and suppression of prostitution, and the regulation of public and private dance halls and places of amusement and recreation. And since general paralysis is one of the late results of an infectious disease, the problem of its prevention should be part of the work of the boards of health, local, state, and national.

General paralysis, then, is one of the late effects of a germ disease, syphilis, coming on usually from six to ten years, but sometimes as early as three, sometimes as late as forty years, after infection. To prevent it we need to know how and why the germ disease is acquired. It is fairly wide-spread in the community,—we do not know how wide-spread. Probably it is proportionately more prevalent in the cities than in the rural districts; and it varies very much

in different countries and sections of the same country. It is variously estimated at from 1% to 15% of the population. It is infectious, that is capable of being transmitted to other persons, but only in certain stages. The germs may lie dormant, as it were, in any person for years, even as many as forty.

How do people get infected?

A very few do so unknowingly and innocently. An infected husband or wife may give it to the other, who did not know of the infection. An infected workman in a factory may get germs on the towel, basin, soap, drinking cup, etc., that he uses, and the next workman, or some other, using the same article may get the germs into a broken place in the skin and himself become infected. A pipe or plug of tobacco, or a pencil which one puts in the mouth shared with another may be the medium. At a party a young man infected several young women on the cheeks and lips in a kissing game. Laws against the public drinking cups and against the use of public towels and bathing suits without sterilization after each use, are to guard against syphilis as well as tuberculosis. The so-called eugenic marriage laws are really directed against syphilis and other venereal diseases, much more than against tuberculosis and non-infectious diseases.

But the vast majority of syphilitics acquire their infection through prostitution and clandestine intercourse.

Men, usually young men, are the chief causes of its spread, for it is men who create the market for prostitutes and who patronize them. No man is compelled to patronize them. If men did not want to buy, there would be none to sell.

No woman can be long in the trade (for prostitution is a trade, organized as such chiefly by men) without acquiring from her customers one or more of the venereal diseases—then she transmits them to subsequent customers.

In a general way it is probably true that the number of men who patronize one woman and become infected through her is much greater than the number of women patronized and infected by one man. Hence the prostitute is looked on as the chief spreader of venereal disease. This is the ground for the segregation and periodical examination of these women in those places where such efforts are made to suppress these infections. But there is little use of segregation and examination of the women without equally vigilant examination of their customers. Hence the failure of all these efforts, for the male customer of prostitutes has never been systematically segregated and examined.

Until public opinion has gone so far as not only to back up the boards of health in requiring notification of the venereal infections as they do of others, such as diphtheria, etc., and to sanction the establishment of clinics, both in-patient and out-patient, for the care of such patients, but also to establish the same sexual standard for men as for women, to show equal disapproval of the one delinquent as of the other

*NOTE: One and one-third per cent. of syphilitic Austrian prostitutes had general paralysis. Four and three-quarters per cent. of syphilitic Austrian army officers had general paralysis.

and to encourage the suppression of the male prostitute, the man who seeks and supports the woman—not until then will the venereal diseases be eliminated. *But this can be done*, as any other infectious disease can be wiped out, whenever the public sees that it is to its interest to do so.

Until that time comes, we can still do something to diminish the incidence of syphilis, and so save some from general paralysis. We need to know why people expose themselves to infection, especially young people.

Most of them are quite unaware of the risks they run, or regard the infections as trivial—"nothing more than a cold." And, fortunately or unfortunately, it so turns out with some; it is all too late when the later consequences are seen in the others. Early education and information adapted to the age—not sentimental, goody-goody talks, but straightforward truth—whenver the boy or girl shows inquisitiveness about sex matters, is a safeguard. It may be at 6 or 7, or 10 or 11, or 15 or 16. It is at least as early as the latter age, and usually as early as 8 or 10, that curiosity is aroused.

The young man and the young woman seek sexual gratification together for different reasons. Both perhaps from strong sex feelings, from self-indulgence, and from ignorance of sex hygiene. The young man seeks it from curiosity, love of excitement and of adventure, desire for a new sensation, or because his companions do it and he is ashamed not to, or because he thinks it is manly, or because he is told that before marriage he must "prove his manhood," or sometimes, I regret to say, because of the advice of some physician or other elder who has not outgrown certain traditions of the ignorant and whose moral insight is not very acute.

Young women have, as a rule, denser ignorance of sex matters than young men. In the beginning most of them are the sought rather than the seekers, however it may be later. Of those who become prostitutes, probably three-fourths are somewhat feeble-minded—that is, they are pleasure loving, have no foresight, little sense of responsibility, are vain and foolish, easily influenced, and are inefficient as workers. Advantage is taken of these characteristics and they are easily led into the life. Investigations have shown that only a small percentage go into it from stress of poverty.

What, then, can you individually do to lessen or prevent general paralysis? We must forestall all the bad reasons for indulgence with better ones for non-indulgence in clandestine intercourse. Those who have had, or been exposed to, syphilis can be advised to consult some thoroughly competent physician, not the advertising quack, with regard to treatment. Some of the newer methods offer a chance of preventing the later onset of general paresis. You can help make the public opinion which backs up those individuals and organizations that are combating its causes. You can aid these organizations

financially. And in your own homes and communities, as you have the opportunity, you can teach boys and girls the fundamental principles of sex hygiene, bringing out the higher, beautiful side of it; you can teach them self-control, self-respect, and respect for others; you can teach them that only in wedlock, when the child—the possible product of the union—can be reared and cared for in a home by *two* parents, that only then is there justification for sexual intercourse. And you can teach the boys especially, not only that continence is not harmful and that sex gratification is not necessary, but that it is unmanly, unchivalrous, unsportsmanlike, dishonorable, selfish, cowardly, despicable to take advantage of a girl's weak-mindedness, vanity, or strong sex feelings; that the only honorable, manly thing to do is to protect her against herself, if need be; that he should take pride in protecting her, not in exploiting or taking advantage of her.

I have gone into this at length, because general paralysis is an absolutely preventable disease if we will only take the necessary steps. No one need have it if he will keep out of infection's way, and nothing compels him to go into it except his own self-indulgence. And the means necessary to make general paralysis impossible, that is, elimination of syphilis, will help diminish feeble-mindedness, and some of the other psychoses as well, and will help in many other necessary and urgent reforms.

V. *Toxic psychoses.* The next group of mental diseases is due to intoxication either by substances introduced into the body from without or arising from within it. We call them the toxic psychoses, and they make up about 14% or 15% of all admissions. Since the Harrison law went into effect there have been a number of admissions due to the withdrawal of morphine and cocaine from those who had become habituated to their use, and some of these have been insane. There are delirious conditions in acute germ diseases, like pneumonia and typhoid fever, and there are deliria and other states of mental aberration in other physical illnesses, such as advanced heart and kidney diseases, and so-called auto-toxic diseases.

The deliria and wandering of the mind in acute illnesses are partly preventable, for they are partly due to too free use of sedatives, hypnotics and narcotics, and partly to the fact that too little attention is paid to the amount of food and water that the patient takes. The parched lips and dry tongue and the loss of weight of the patient with acute illness are very largely due to insufficient supply of water and food. It is a mistake to think the patient does not need as much as when well—he often needs more, because, if he has fever, his tissues are being used up faster, and he perspires more. If not given food and water enough, his mind begins to wander a little, at night especially, and he sleeps less well. Sleeping medicines may stupefy him into sleep at first, but they soon lose their ef-

fect and begin to cause a delirium of intoxication on their own account; and meanwhile they interfere to some extent with digestion. Thus the delirium is kept up and the patient becomes unmanageable, is thought to be insane, and is committed. This is the history of a number of cases, most of whose deliria could have been prevented.

By far the most important part of the toxic group is alcoholic insanity—a wholly preventable psychosis, for no one would have it if he did not drink. Fully twelve and one-half per cent., one-eighth of all the admissions to the hospitals for the insane, are due directly to this cause; and in an indefinite number of other psychoses the use of alcohol is an important contributing factor. Like general paralysis, it is a psychosis chiefly of men.

While the man who is known to drink excessively is more apt to become insane, the so-called moderate drinker, who never becomes intoxicated or goes on sprees, is by no means exempt. It has been shown experimentally that the man who continuously drinks a couple of glasses of beer three times a day, or its alcoholic equivalent in wine or liquor, keeps his efficiency as to speed, accuracy and amount of work, and as to general judgment, some ten to fifteen per cent. below his normal; but he does not realize it—on the contrary, he thinks he is doing his work very well. The more he takes daily, the lower is the level of his efficiency. Even the amount of alcohol in a single glass of beer or wine has for the occasional drinker its impairing effects, which do not wear off completely for 24 to 36 hours. Alcohol, even in moderate doses, diminishes sensibility, physical, mental and moral. It lessens self-control, both moral and muscular. It lessens resistance to fatigue and physical illness, especially the infectious diseases, and to the shock of surgery and accidents. It has certain medicinal uses, in spite of these effects.

How shall we prevent alcoholic insanity?

The internal use of alcohol is so wide spread that we cannot easily pick out beforehand those who are liable to become insane from its use. But since its effects are almost wholly deleterious, and often dangerous to the lives and limbs of others as well as the user, the limitation or suppression of its general use, even in so-called moderate amounts, will be beneficial to society, to labor, and to business. By as much as drinking is generally abolished, by so much will alcoholic insanity be lessened.

There have been many movements, some more judicious than others, to bring about this reform. Those which seek to educate the public as to the exact facts, without prejudice, exaggeration or sentiment, are the best. For an intelligent and educated public sentiment will back up restrictive measures which aim at wholesale protection against the evils of alcoholism, by rigidly restricting the sale of that which causes them.

But we need to work individually, too, and to do that we need to know why the individual drinks.

A few drink at irregular intervals because from time to time an almost or quite irresistible craving for it comes over them; in one patient of mine a sip of wine on a social occasion would be sufficient to start the craving which could not be controlled until the patient was too stuporous with drink to take more. The craving lasts for a few days or a few weeks, and in the intervals the patient takes no alcohol. These are the dipsomaniacs, so-called.

Some drink beer, ale, stout, wines, champagne, whiskey, brandy, gin or rum for what they regard as medicinal reasons—to give an appetite for meals, to promote digestion (as they think), to produce sleep, to ward off the effects of snake bite or of exposure to wet and cold, to relieve pain; or to "brace up" if "feeling like a boiled owl" the morning after heavy drinking, or if fatigued or in anticipation of carrying through some social or business or other straining occasion; or to relieve the feelings of nervousness and tension when fatigued; or to relieve feelings of downheartedness, blueness, depression, worry, or "drown sorrow" or disappointment, or the general "down and out" feeling; or to give courage and strength for various undertakings, from social occasions to fighting.

People often drink merely from custom—in many countries and regions it has been an immemorial habit to drink at meals or other times. Some—especially young people—drink because others do. They don't wish to appear different from others, nor to be thought sissy or cowardly or unmanly or tied to their mother's apron-strings. Some drink socially, as at dinners, to loosen tongues and "make things go." Many drink for the sake of sociability, friendliness, hospitality. And a limited number drink just for self-indulgence, some because they like the taste, but more because they like the effects.—the warming up, the relaxation, the mild exhilaration, the feeling of ease or of capability, or the relief from discomforts, pains or blues. Many have told me they did not care for the taste, but they did not wish to endure discomforts when there was something that would relieve them.

These inadequate or erroneous reasons, based on ignorance or self-indulgence, must be supplanted by knowledge and a desire for self-control.

If everyone knew what the effects of alcohol really are, its internal use would be almost limited to the prescription of physicians.

The self-indulgent need to be taught better self-control—a process that should begin in early infancy. Some of them, and those who drink for superficial social or other reasons would not do so if they fully realized what the effects of drinking are. These need educating.

You can individually help prevent not only alcoholic insanity, but many of the more

extensive evils resulting from the widespread use of alcohol, by discouraging its use in your own homes and among the persons of your acquaintance; by increasing the number of those who with dignity, courtesy and courage, not apologetically, decline the social drink; by teaching your young people early to avoid alcohol as you do to avoid indigestible food or to play with matches, and by teaching them not to "treat" or be treated. If you support with your votes, influence and other backing those who are conducting a sensible educational propaganda, those who are promoting industrial insurance and employers' liability laws, and those employers who refuse to engage workmen who drink, you will help. You may need to remember that money paid by dealers into the city or town treasury for licenses to sell liquor by no means pays for the necessary additional police protection, court expenses, accidents and injury to persons and property, support of jails, reformatories and houses of correction, and of the alcoholics in them, support the alcoholic insane, loss of wages, support of those dependent on the drinker, and the cost of educating and taking care of the defectives that he may procreate. It is well to remember, too, that the standards of living are lowered and the value of property deteriorates in the community or part of it where alcohol is freely used—you do not like to go through the saloon districts. In addition you can help by trying to enlist the best intelligence of the community in the effort to devise and operate an effective, attractive, and harmless substitute for "the poor man's club."

VI. *Miscellaneous psychoses.* The remaining fifteen to twenty per cent. of admissions are made up of small groups of cases, such as paranoia, epileptic insanity, etc., and many others of doubtful diagnosis; but at least a small proportion of them would unquestionably be prevented by the measures taken to prevent the psychoses which have already been considered. For the rest, we do not yet know enough about their nature or their causes to direct any specific efforts against their occurrence.

CONCLUSION.

In conclusion we may say that an indeterminate but very large amount of feeble-mindedness can be prevented; that of the insanities proper, the alcoholic and drug psychoses and general paralysis—a fifth of all the cases occurring each year—can be absolutely prevented; that of the fatigue psychoses a large proportion, possibly a half or three-quarters, might be avoided; that possibly a small proportion of the dementia praecox and arteriosclerotic psychoses might be obviated; and that a small proportion of the remaining forms also might be prevented. Thus if the means here suggested should be universally known and applied throughout the state, it would happen in the course of a generation that there would occur yearly, at a very con-

servative estimate, a quarter, and at a reasonable or moderate estimate, a third less insanity in the state, and I do not dare to say how much less feeble-mindedness,—perhaps three-fourths. The indirect benefits to the community in lessened costs to the state,—and hence in taxes—in lessened crime and dependency, in better health, better efficiency, better standards of living and better morality, are incalculable.

PELLAGRA; A REVIEW OF THE SUBJECT, WITH REPORT OF A CASE.*

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I WAS requested by your program committee to make an address to you tonight to celebrate the completion of my term of office as president of this society. At the time of that request, the subject and the case that follows were greatly interesting me and fresh in my memory, so in lieu of an address, I trust in presenting this paper to be able to lay before you an interesting subject and an unusual case, and that the subject matter will help to familiarize us with a clinical picture that has been absent from the minds of most of us.

Pellagra is a disease characterized by periodic digestive, cutaneous and cerebro-spinal symptoms.

HISTORICAL REVIEW.

It is a very old disease, having been recognized in Spain as early as 1735 and first described by Casal in 1762. Casal called it "Mal de la Rosa." In 1750 it existed in Italy where it was described in 1771 by Frapolli who named it pellagra (a rough skin). By the eighteenth century, in Italy, France and Roumania, it was a commonly recognized disease. Now, it is found not only in these countries, but also in Portugal, Spain, Egypt, South Africa, Bessarabia, Russia and in the United States. Doubtless, it is present but unrecognized in all countries where conditions of living compare favorably with those of the above named countries. Its highest prevalence in the United States is reached in the mill villages of South Carolina where cases have averaged 150 to every 100,000 population.

Not until recently did this disease become recognized in the United States, although it must have existed here for a great many years. In the states where the disease is now known to prevail extensively, older physicians are able to recall many cases which failed of diagnosis in the past, but which, in the light of their present knowledge and experience, they would not hesitate to call pellagra. Babcock states that he

* Read before the Fall River Medical Society, December 8, 1915.

ought to have made the diagnosis of pellagra in South Carolina nearly twenty-one years ago. Evidence is not lacking that the disease existed in this country in the early sixties, that it was at least in part responsible for the mortality in Andersonville prison during the Civil War, and that "cases of pellagra, native and imported, have probably occurred in general practice and especially in asylums and hospitals in this country for the last half century, although the diagnosis may not always have been correctly made." (Babcock).

At first the cases were confined to the South, but gradually reports came from all parts of the country. It has now been recognized in over thirty-two states.

As early as 1862, Tyler reported the first case in Massachusetts. Then comes a break until 1910, when Fitzgerald, Dean, Lee and MacDonald reported cases. With the cases this year coming from such widely different parts of the state as Danvers,⁵ Lowell,³ Northampton,² Holden,¹ Worcester,¹ Newton,¹ Winchendon¹ and Taunton,¹ we are forced to realize the general distribution of pellagra in this commonwealth. Since the first of January, 1915, there have been reported more than sixteen cases of pellagra in the various towns of this state.

From the Rhode Island State Hospital for the Insane, Dr. Cohoon has reported to the State Board of Health, fifty-seven cases up to September, 1914, and there have been a few cases since, together with a few (very) outside of the Institution. At present there are two cases in the Rhode Island Hospital.

Statistics showing the number of deaths in Massachusetts and the total number in the United States from pellagra are as follows:

Year.	Deaths in Massachusetts.	Deaths in United States Reg. Area.
1910	1	368
1911	1	659
1912	5	674
1913	11	1015
1914	18	*
Total	36	2716

* Figures not available.

ETIOLOGY.

The etiology of pellagra has been one of the most fascinating subjects for research in recent years. It yet remains an unsolved problem.

As early as 1810, Marzari declared the cause of pellagra to be the eating of diseased corn and from that time, a large number of able men have insisted that maize poisoning was the etiological factor. Those belonging to this class have been named Zeists. They were in turn divided into two factions: one set considered that the symptoms resulting from this corn poisoning were due to certain nutritive deficiencies, the others believing they were due to toxic substances developed by a biological agent.

One of the great students, Tizzoni, admitted finding pellagra cases among people who did

not use corn as food. Other physicians have insisted that pellagra was an infection.

Sambon in 1905 claimed to have proven the buffalo gnat (*simulium reptans*) to be the intermediate factor in transmitting the disease, but even the latter was obliged to admit that cases of pellagra were found where the buffalo gnat did not exist.

Nichols isolated spore-bearing bacterium from the stools of pellagra patients which survived steaming for two hours. Because of this he claimed that the same organisms could survive cooking and be transmitted in food and was a probable cause of pellagra.

Wood isolated a strepto-bacillus which stood ninety degrees centigrade for one hour and drew a like conclusion.

The stable fly and sand flea have been claimed to be the cause by other investigators.

The Thompson-McFadden Pellagra Commission stated in January, 1914, that "pellagra is, in all probability, a specific infectious disease communicable from person to person by means at present unknown." Cencelli in 1915 stated that pellagra was due to chronic poisoning by silica in colloidal solution in water, that is, mineral colloids caused a mineral acidosis which would give rise to symptoms such as we now recognize as characteristic of pellagra. Treatment based on the theory of neutralization of these poisons has proven very satisfactory. It is to be noted that no attendant in an institution for pellagra patients ever contracted the disease. It is most frequent in middle life and amongst the female sex. The negro race is very susceptible. It is prevalent among the laboring class and seems to thrive particularly in the spring and autumn seasons.

It has seemed entirely logical to some thoughtful students that neither food poisoning nor infection were the cause of pellagra, but that it was an improper dietetic balance with accumulated toxins which acted as the true cause.

After several years of careful investigation, the United States Public Health Service has recently declared that pellagra is probably of dietetic origin. Of equal importance, they assert that it is not an infectious or contagious disease.

PATHOLOGY.

Acute pellagra shows at post-mortem examinations, evidences of acute and chronic poisoning, such as central neuritis. There is not found any proof of infection of the nervous system with micro-organisms. The examination of chronic cases give no definite pathology that can be attributed solely to pellagra, although fatty and fibroid degeneration, chronic alterations in nerve cells, increase of glia fibres, permanent destruction of nerve fibres and a marked increase of amyloid bodies have been noted.

In acute cases, there is perivascular infiltration, indicating general intoxication, indirect chromatolysis of nerve cells, astrocytosis and

presence of ameboid glia cells. Osler states that acute cases show intestinal atrophy, fatty degeneration of internal organs, alterations in the cord, degeneration of the lateral columns in the dorsal region and posterior columns in the cervical and dorsal regions, also atrophy of the cerebrum.

SYMPTOMS.

Onset is usually in the spring, with weakness, headaches and depression. The symptoms differ, first, according to the stage of the disease, and second, according to the type. The stages might be classified somewhat as pulmonary tuberculosis, *i.e.*, incipient, moderately advanced and advanced.

The usual type or clinical form may be seen, first, as the acute febrile or typhoid, second, as the chronic recurrent, and third, cases without the skin manifestation—the pellagra *sine* pellagra. Since pellagra is a poisoning, the symptoms depend upon the degree of intoxication.

The chronic, recurrent form may be best described under three stages. The first stage, the clinical manifestations, of trifling character, may not even lead to a call on the physician, yet the patient knows he is not well. There may be a tired feeling, loss of appetite and perhaps, "the blues." He may be bilious and have headaches. The digestion may be characterized by a feeling of fullness after eating with resulting eructations and heartburn. Transient attacks of diarrhea may occur. The tip of the tongue sometimes is red. These symptoms often appear so slowly that they are not noticed for weeks after the onset, and with cold weather the patient again improves.

Symptoms show a tendency to recurrence, each attack taking its toll of vitality and leaving irreparable damage behind.

Second Stage. After repeated attacks of the first stage there may follow marked accentuation of all of the foregoing symptoms. The patient becomes weak in the lower limbs and does not care to try to walk or exert himself. There is marked mental depression, soreness of the mouth and tongue that comes and goes. Gastro-intestinal symptoms become marked by alternating diarrhea and constipation. There is loss of weight and poor appetite. Unusual sensations may be present in the legs and feet such as formication and burning. Eechymosis and petechiae appear on the back of the hands and sides of the neck, which on fading, leave dark, discolored areas. The skin becomes dry, wrinkled and poorly nourished.

Third Stage. This is the classical pellagra characterized by stomatitis, a smooth red tongue, languor, salivation, bulimia, nausea, periodic vomiting and intractable diarrhea with slimy, foul-smelling, green stools. The temperature is subnormal. A symmetrical erythema may appear on the hands, usually on the parts exposed, as arms, face and neck, which resembles sunburn. There may be vesicles or bullae followed

by ulcers. The spinal symptoms include paresis, thesias, paresis, paralysis of the bladder, a spastic, paraplegic gait. The cerebral symptoms may show vertigo, epileptiform convulsions, confusional insanity and dementia. The final end is one of wasting and cachexia and terminal diarrhea.

The acute febrile or typhoid form is characterized by pain in the epigastrium, headache, nausea, vomiting, diarrhea, bloody stools, fever delirium and a typhoid course, terminating fatally in from ten days to six weeks.

Pellagra *sine* pellagra may have any combination of the symptoms named minus those of the skin.

PROGNOSIS.

The earlier is pellagra recognized, the better the prognosis. The chronic type without mental involvement gives a good prognosis; the insane or mental cases, a bad prognosis. The acute or typhoid form is usually fatal.

DIAGNOSIS.

If you are familiar with the clinical picture, typical cases are easily diagnosed, yet the mild, incipient or atypical cases are liable to be diagnosed as anything and everything but pellagra, such as pulmonary tuberculosis, malaria, syphilis, acute delirium, hookworm disease, dermatitis exfoliativa, eczema, etc.

The differential diagnosis is concerned with purpura, sprue, scurvy and the nervous manifestations with general paresis.

There is no characteristic blood picture. Stomach analysis may show diminution in hydrochloric acid and pepsin, or their complete absence.

It is irregular in its manifestations and a long drawn out disease, perhaps requiring years to develop characteristic symptoms that we recognize.

The triad of dermatitis, nervousness and diarrhea make the diagnosis easy. It must be borne in mind, however, that cases may be found with any one of these factors absent. These symptoms when present may all appear at different times without apparent relation. Diarrhea in a pellagrous area is regarded suspiciously. Gastro-intestinal symptoms may persist through the cooler months and be the forerunner of diarrhea.

When all ordinary causes have been eliminated, dyspepsia characterized by a loss of appetite, nausea, sore mouth, stomatitis, gastric pain, pyrosis, distention and belching, lasting from a few weeks to months, especially in spring or summer, should make one suspicious of pellagra. The tongue is claimed to be quite characteristic; shedding of epithelium, appearing smooth and red at the tip, and with denuded areas extending back towards the base, again, it may be cracked and fissured.

It is most common in men from twenty-one to forty, in women, from forty-one to sixty,

leaving children practically exempt. Nervous and mental disturbances occur in nearly fifty per cent. of all cases. Mental manifestations are more apt to be found in the weak-minded or defective. Over fifty per cent. of the deaths in institutions for insane in South Carolina were reported as due to pellagra. Therefore, pellagra must be eliminated as a causative factor in these cases.

TREATMENT.

The treatment for pellagra is as devious and as unsatisfactory as the search for its cause has been. We find almost everything that has been used in pathological conditions tried as a possible cure.

The Bulgarian lactic acid bacillus has been tried. Shoemaker states that cases have been relieved by surgical interference, *i.e.*, gall bladder drainage, appendectomy, appendicostomy causing drainage and increased leucocytosis. He also states that intravenous injections of metals, metallic colloids, electrically prepared, and organic colloids of metals, such as antimony, copper, selenium, silver, arsenic and iron, caused chills and a marked leucocytosis in forty minutes. A continued treatment gives an increase of lymphocytes and other white cells.

Autoserum obtained from artificial blisters has been used. Picric acid external, and internal, ten to thirty drops in a one per cent. solution has been recommended. Drugs such as bismuth, salol, quinine and emetine have also been used.

Trisodium citrate, 1 cc. of ten per cent. solution hypodermically daily; thyroid extract and sodium chloride are used.

Atoxyl, seven and one-half grains three times daily, arsenic trioxid and arsenate of sodium, sodium cacodylate, Fowler's solution and Donovan's solutions are suggested.

Astringents for sore mouths, such as silver preparations, protargol and argyrol are used.

For diarrhea, tannic acid has been effectively tried.

When there is sore mouth, diarrhea and gastro-intestinal disturbances, diet is made very difficult.

Rest and good nursing are most important.

Hydrotherapy has been tried.

Prophylaxis is impossible without a cause being known.

The case which follows came under my own observation and in so far as I know, the first case which has been recognized as pellagra in Fall River.

Mrs. H. Widow. Age, 63. Born in England and lived in the United States 41 years. Occupation, housewife and practical nurse for the last 25 years.

Family History. Father died of heart failure, probably due to asthma. Mother died of "dropsy." Two sisters living; no brothers or sisters dead. Husband died 30 years ago of heart trouble after illness of 11 months. Has had 7 children,—4 girls

and 3 boys. One boy died at 27 years of age from pneumonia; one, at 21 from pulmonary tuberculosis. One of the 4 girls living had a tubercular kidney removed 5 years ago.

Past History. Always well. Average weight, 180 to 190 pounds. Does not remember about diseases of childhood. No miscarriages. No skin eruptions. Menopause at 50 years with little disturbance. No leucorrhea or bloody discharge since menopause.

Habits Regular. No alcohol or drugs used. Hard worker. Appetite good and sleeps well. Home conditions good. Even temperament although somewhat nervous.

Present Illness. First period, May, 1913. Patient was first seen by me in May, 1913. She complained of eructations and stomach trouble, ringing in the ears and a feeling of weakness. She complained mostly of her right ear, which she said kept her awake nights. She was sent to an ear specialist, with but little improvement in the ear condition. Her appetite was fair. She was able to do her work and did not consider herself ill. The physical examination at this time corresponded to the description that follows: Temperature, pulse and urine were normal. No definite diagnosis was made at this time.

Second period, from March 30, 1914 to May 20, 1914. The patient again consulted me, once in March and twice in May at my office, for the same conditions as described above. She showed some loss of weight, increased nervous tension and mental anxiety about her condition; some increase in digestive disturbances, which was shown by a feeling of distress on eating, loss of appetite and poor sleeping. The ringing in the ears was present and gave her great annoyance. She was worried about her condition without being able to state just why. There was no pain. The most pronounced clinical feature presented was that of mental stress and loss of proper mental balance as displayed by an anxious look and a sluggish mental activity.

Physical examination as follows: Blood pressure was systolic 155. Urine, pulse and temperature normal. The patient at this time gave one the impression of suffering from blood depravity and a stomach disturbance probably due to an obscure gall-bladder. There was a low nervous and physical tone. There was no one symptom sufficiently marked to warrant a diagnosis. An interval of over three months occurred, during which time I did not see the patient.

Third period, October 3, 1914, to April 1, 1915. Patient again consulted me in the fall, complaining of dizziness, a lump in the stomach after eating, frequent eructations, vertigo, marked anemia and a loss of weight from 172½ pounds to 159¾ pounds. Increased weakness was evident, and the anxiety mentioned before became more pronounced. There were occasional spells of vomiting. She was sleeping poorly. There was a marked indifference as to exercise and considerable weakness in the limbs. In November and December, she complained of sore mouth and tongue, rendering eating and drinking somewhat painful. The bowels were too free at times. Urination normal. In March, 1915, there appeared on the back of both wrists a dry, scaly, eczematous eruption extending from the back of the hands up the forearms for about two or three inches. This condition persisted for about two months and then slowly cleared up.

Stomach analysis at this time gave no evidence

of blood or malignancy. A hypomotility was indicated by six ounces residual amount in one hour. Total acidity, normal. Free hydrochloric acid was absent. Temperature, 97 to 98; pulse, 74 to 84. Blood pressure: systolic, 140; diastolic, 80. The blood analysis was normal excepting for the absolute red blood cells which were about 3,900,000. A differential count failed to show any nucleated cells or indications of pernicious anemia. Hemoglobin was 80%. Urine analysis, normal. Frequent examination of the vomitus gave no indications of blood or malignancy.

During the early part of this period, the patient was able to come to my office, but during the last two-thirds of the time, she felt unable to walk any distance.

At the end of this period, a diagnosis should have been made. The clinical picture, however, was so strange that I confessed to the family my ignorance as to the cause of the illness. I suspected malignancy, but that was about as far as I dared to go.

Fourth period, April to October, 1915. This period is marked in its first half by an improvement. In the early part of the spring and summer, the patient was able to eat heartily and almost anything. For a few weeks, there was an interval of apparent improvement. She spent about a week at the seashore, but the summer, however, saw the recurrence of more severe symptoms. During the fall months there was an increase in mental abnormalities that was quite marked. There was a sluggish mental activity, fear of impending catastrophe, dislike of being left alone, altered periods of torpidity and morbidity. In her better moments she chided herself for worrying so much, and yet she seemed to be in the grasp of some mental weakness that rendered her helpless to prevent these attitudes. A few weeks before death, the mind was almost constantly confused and for days she would lie in a stupor. At this time for a few days, there was loss of control of both sphincters. When forcibly aroused, she would appear to believe she was dying. Following this period, the sphincters regained their control. She would lie muttering for hours and then perhaps rouse up and answer questions and talk quite connectedly for a short time. There were pains in her thighs of which she complained, but evidently transitory and not very severe. The skin was dry and rough. Ecchymosis appeared and persisted about the wrists and forearms. There was a continued loss of weight, going down from 143 to 115 pounds (estimated) in October. The limbs became weaker. The gums were too shrunken to hold the plates of false teeth. There were increased frequent spells of diarrhea. The week before she died there was uncontrollable diarrhea, and marked illusions which were manifest by her belief that she was burning England and destroying England and that she was committing some terrible crime. Her face was pinched and drawn, with an exceedingly anxious expression. The eyes were sunken. The tongue was red at the tip with a smooth channeled area extending two-thirds way back. It was cracked and fissured. There was a period of continuous salivation with wiping of the tongue and lips until they were sore. A few days before death, a blister the size of a quarter appeared on the left ankle under the external malleolus. The abdomen became greatly distended. During the last week of life, if touched, she would cry out with pain.

Although this period is continuous with the last, yet its symptomatology differed. There was a cessation of stomach and skin symptoms and an evident improvement in the blood and hemoglobin.

Physical Examination. In October, 1914. Well developed and nourished; height, 5 feet, 6 inches; weight, 171 pounds; complexion, pale; skin, slightly dry; false teeth; wears glasses to read with. Neck and shoulders normal excepting for a tumor the size of the hand, oval in shape, flat on the outer surface, soft in consistency and containing a few firm areas within, about the size of a marble. The tumor has been as now seen for the last twenty years without changing in size. It lies on the left shoulder against the base of the neck, overlapping at its middle point, the middle third of the clavicle, its lower half lying on the chest. It is movable, not tender, and diagnosed as a lipoma. The chest is full and well developed, normal in shape. Mammary glands, large and pendulous, free from suspicious signs. Heart apex in the fifth interspace nipple line, and right border, two cm. to the right of the mid-sternal line. Sounds are normal excepting for a soft, low, systolic murmur heard at the apex. Lungs are normal. Abdomen well covered with subcutaneous fat, somewhat flabby and pendulous. Liver and spleen normal. No masses or abnormalities detected on palpation. No enlarged glands found anywhere. Pelvic examination, normal. Rectal examination, normal. No abnormalities of the feet, limbs or hands excepting for slightly enlarged phalangeal finger joints. Reflexes normal excepting for slight sluggishness in pupil reflexes. Urine examination, negative. Blood pressure: systolic, 140; diastolic, 80. Temperature, 95 to 98. Pulse, 78 to 120. Ophthalmoscopic examination, negative. Patient refused x-ray bismuth examination. Numerous physical examinations were made by myself and one each by two able consultants. No new points in physical examination were noticed except the steady loss of weight, changing conditions in the skin as noted, and a few weeks before death, a slightly positive Babinski.

This case presents aspects of unusual interest when considered in relation to the various theories as to etiology.

Let us have in mind that the belief in the maize poisoning is now so well fixed in certain European governments, that preventative measures and health laws are framed in accordance with that conclusion. Yet in the case reported, it was impossible to learn of any occasion where maize was used.

Recall again the statement recently made by the United States Public Health Service that pellagra is caused by a diet faulty in the relative amounts of vegetable and animal proteins such as might be found in a poorly mixed or a badly balanced diet. Yet my patient had no peculiarities of diet, but ate meat and had a variety of food such as was enjoyed by four other healthy members of the family.

Reviewing the subject, one often meets the statement that it is a disease of the poor and most often found in filthy surroundings. Yet it is admitted that cases may be found among the well-to-do. The home of the case reported was comfortable, clean and above the average in all sanitary arrangements.

The Thompson-McFadden Commission, as quoted before, made the following statement in 1914. "Pellagra is, in all probability, a specific infectious disease, communicable from person to person by means at present unknown." The relation of this theory to the case under discussion, because of the following facts, has a special interest. For a number of years, there had been sent to the home of the patient, certain articles of fancy work and some fruit from Porto Rico. The fancy work had been done by Porto Rican women. One cannot but stop to speculate as to a possible connection between the theory last stated and these facts.

Only a few weeks before death was I certain I had to deal with a case of pellagra. My tardiness in recognizing the condition was because of my lack of the typical clinical picture. Here, as in many other cities, the recognition of one case of pellagra, assuring us of its presence, may stimulate study and lead to the discovery of many unrecognized cases. The fact that it had been reported in two cities as near as Taunton and Providence should have assured us of its presence here. Then it is said to be especially prevalent in southern mill towns, the character of whose industries and inhabitants is much like our own. Here, many of our foreign inhabitants come from pellagrous countries, all of which lends to the probability of many cases now existing among us unrecognized.

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lective name of the "acetone bodies." Their relation in the order of formation is probably beta-oxybutyric acid, diacetic acid and acetone. The acetone bodies are due to one common cause, that is, a peculiar inhibition of the oxidative processes. The failure of oxidation is not due to lack of oxygen, but to some local interference with oxidation. The excretion of beta-oxybutyric acid represents a much more advanced degree of oxidative perversion than the excretion of acetone or diacetic acid.

Origin of the Acetone Bodies. Beta-oxybutyric acid can be formed only from fats, by degradation, or by synthesis from bodies containing two or three carbon atoms. In the latter case it would be immaterial whether these bodies were a product of the disassimilation of albumen or of fat. It is a one-sided view to consider only the fats or only the proteins in this connection. The phenomenon of acetonuria with its many modifications is easily comprehensible if it is understood that acetone is a synthetic product derived from certain bodies which contain few carbon atoms and which may be derived from different sources. Normally the fragments of the proteins and fat molecules which contain but a few carbon atoms undergo further oxidation. This occurs, however, only in the presence of a sufficient quantity of carbohydrates. The explanation probably lies in the fact that the carbohydrates contain so much oxygen. A portion of this oxygen is presumably liberated when the carbohydrates are broken down and is used for the oxidation processes.

Acetone is normally present in the urine in small amounts. Diacetic acid and beta-oxybutyric acid are never present under normal conditions. The excretion of acetone is increased both in health and disease if the diet consists exclusively of meat and fat. This increase is not due simply to starvation, because the acetonuria persists even if the caloric value of the food is brought up to normal by the addition of fat. The addition of a small amount of carbohydrates under these conditions does not prevent the excretion of acetone in the urine. If, however, sufficient carbohydrates are added, the acetonuria ceases. The addition of fat to an ordinary diet does not cause acetonuria. The absence of carbohydrates is also necessary.

To sum up, the acetone bodies are formed from fat in the absence of carbohydrates or when the metabolism of the carbohydrates is abnormal. They may also, under certain conditions, be formed from protein, the amount formed from protein being, however, relatively unimportant in comparison with that formed from fat.

The acetone bodies are not formed in the digestive tract. This is proved by the fact that the administration of the acetone bodies by the mouth causes no symptoms.

Action of the Acetone Bodies. The deleterious effect of the acetone bodies is not due to any specific toxic properties which they possess,

ACID AUTOINTOXICATION IN INFANCY AND CHILDHOOD.*

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BETA-OXYBUTYRIC acid, diacetic acid and acetone may be grouped together under the col-

* Read before the Cumberland County Medical Society, at Portland, Maine, February 11, 1916.

but to their acid character in general and to the power which they possess as acids in withdrawing alkali from the organism. It must be clearly understood that the acetone bodies are in themselves not essentially toxic and that they can prove harmful to the body only by removing the bases. Under normal conditions there is a preponderance of bases over acids in the body. When acids are formed in, or introduced into, the body they have a deleterious influence upon it. The body has, however, a very efficient mechanism to guard against this deleterious action. The reaction of the body is regulated through the blood. Acids displace bicarbonate of soda from the blood and set carbon dioxide free. The excess of carbon dioxide is removed through the lungs. A neutral salt is left, which is removed by the kidneys. They excrete acid phosphate and save the base. The proteins, being amphoteric, are also able to neutralize a portion of the acid. Ammonia is also formed from the fixed proteins of the body and aids in the neutralization of acids.

Etiology of Acid Intoxication. In acid intoxication an accumulation of acids occurs as the result of the failure of elimination to keep pace with the production of acids. It may be due to an overwhelmingly rapid production of acids when the eliminating mechanism is normal, as in diabetes, or to the failure of the eliminating mechanism to dispose of a normal amount of acid, as in some cases of nephritis. In the latter instance the urine will contain little or no excess of the acetone bodies. When large amounts of an alkali are given when there is an acid intoxication from the overproduction of the acetone bodies, the elimination of these bodies in the urine may be increased from the setting free of the acetone bodies and the urine contain more of the acetone bodies, although the amount of the acetone bodies in the system is diminished. It is evident, therefore, that the amount of the acetone bodies in the urine does not necessarily show whether or not these bodies are accumulating in the organism.

Lactic acid, which can be formed from both carbohydrates and protein, may probably also be a cause of acid auto-intoxication. Evidence in favor of this assumption is that lactic acid is a constant constituent of the blood after exercise, and in dogs appears in the blood after the cramps produced by strychnine or phosphorous poisoning.

Acetone Bodies in the Urine. It has already been stated that under normal conditions the urine contains a minimum amount of acetone. This amount is so small, however, that it is not recognizable by the ordinary reagents. The acetone bodies appear in the urine within a short time after the cessation of the taking of food. The residual carbohydrates in the adult are used up after the fifth or sixth day, after which time the carbohydrates must be derived from the breaking down of proteins. The amount of carbohydrates which can be formed from the

metabolism of protein is relatively small and is not sufficient to prevent the abnormal metabolism of fat. The reserve of carbohydrates in infancy and early childhood is relatively smaller than in the adult. Therefore, the acetone bodies should appear more quickly in starvation in early than in adult life. I am not familiar with any data which show how soon after the withdrawal of food the acetone bodies may occur in the urine at this age, but from clinical experience I am inclined to believe that they rarely occur from this cause under forty-eight hours. It is probable that when there is an abnormal accumulation of fat in the parenchymatous organs, as is often the case in disturbances of nutrition in infancy, that the formation of the acetone bodies may occur earlier and be greater in amount.

Considerable quantities of acetone and diacetic acid are regularly found in the urine in a large number of diseases accompanied by high fever, both during the course of the disease and during convalescence. These bodies are especially common in the urine in pneumonia. Holt, for example, found that 70% of babies ill with lobar pneumonia showed acetoneuria. The acetone bodies are also very frequently found in diseases of the gastrointestinal tract, especially when there is a diminished ingestion of food and a disturbance of the digestion of the carbohydrates.

Few who have not examined the urine of children regularly for the presence of acetone and diacetic acid realize how frequently they are present. It is a routine procedure at the Children's Hospital, in Boston, to examine the urine for acetone and diacetic acid, as well as for albumin and sugar. They are found so often that no attention is paid to their presence, unless there are some symptoms of acid intoxication. Holt recently stated that acetone was found in 30% of the urines of 200 consecutive young children at the Babies' Hospital, in New York. A pediatrician in Boston told me the other day that acetone was found in 70% of all the urines which were brought to his office during the past year. It is evident, therefore, that the mere presence of the acetone bodies in the urine in children, while it denotes an abnormal condition of the metabolism, does not justify the assumption that the child is suffering from acid intoxication in the absence of other symptoms of this condition.

Diagnosis of Acid Intoxication. How, then, is acidosis, or acid intoxication, to be recognized? It must, of course, under ordinary clinical conditions be recognized by finding the acetone bodies in the urine. It must be remembered, however, that the mere presence of a small, or even of a considerable, amount of these bodies does not justify a positive diagnosis of acid intoxication. Better tests are the examination of the blood for the presence of abnormal acids, the determination of the amount of ammonia excreted in the urine and its relation to the total

nitrogen excretion, and the determination of the carbon dioxide coefficient in the expired air.

The most characteristic symptom of acid intoxication in infancy and childhood, outside of the presence of considerable amounts of the acetone bodies in the urine, is a peculiar type of dyspnea or, rather, hyperpnea, without cyanosis. The peculiarities of this type of respiration are that the rate of the respiration is increased, and that both inspiration and expiration are prolonged, the normal relation between the two being preserved. Another evidence of acid intoxication which is very frequent in infancy is a diminution in the output of urine, complete anuria being not at all uncommon. It is possible that in such instances the primary cause of the accumulation of acids is the disturbance of elimination through the kidneys. Vomiting is very common in acid intoxication in both infancy and childhood. There is, however, nothing characteristic about the vomiting in acid intoxication, and vomiting occurs in many other conditions. Vomiting, therefore, even when excessive, does not of itself justify a diagnosis of acid intoxication. Acid intoxication is not infrequently associated with diarrhea. There is, however, nothing characteristic about the diarrhea. In many instances of acid intoxication, moreover, the children are constipated. The breath not infrequently has a peculiar aromatic odor. This odor is, however, not always present and is decidedly difficult of recognition. The cheeks are often flushed and the lips of a peculiar cherry-red color. There is often, also, a white line about the mouth. None of these signs are, however, pathognomonic. It seems evident, therefore, that the recognition of acid intoxication is a much less simple matter than would appear from the statements of many physicians and of the newspapers.

Acid Intoxication in Recurrent Vomiting. It has been recognized for some years that certain cases of what is commonly known as recurrent, periodic, or cyclic vomiting are associated with the presence of the acetone bodies in the urine. In most of these instances it is probable that the acetone bodies are simply a manifestation of the inanition resulting from the vomiting and the consequent starvation. In others it is presumable that the symptoms are due to an acid intoxication. The reason for this presumption is that in certain instances the acetone bodies are found in large amounts in the urine at the very beginning of the symptoms, at a time when they could not possibly be due to inanition. Moreover, the symptoms cease with the disappearance of the acetone bodies.

Acid Intoxication in Diarrhea. The acetone bodies are also found not infrequently in the course of severe diarrheal conditions in infancy and early childhood. The majority of infants with severe diarrhea die, however, without any evidences of acid intoxication, either in the urine or symptomatically. On the other hand, a certain number of infants with severe diar-

rhoea not only show large amounts of the acetone bodies in the urine, but show the typical hyperpnea and have a marked diminution in the output of urine. The majority of these babies die. In many of these instances, however, the symptoms of acid intoxication may be relieved by suitable treatment, but the babies die, after a lapse of twelve or twenty-four hours, without further symptoms of acid intoxication. It seems evident that in these cases the acid intoxication is a secondary manifestation and not the cause of the disease, although it may be in certain instances the cause of death.

Acid Intoxication in Infections. The acetone bodies are also found in large amounts in association with vomiting, with or without diarrhea, in infants and young children in the course of, or following, various infectious diseases. These diseases may of themselves not be serious. They are very likely to be relatively mild infections of the nasopharynx, tonsillitis, or "grippe." In these instances the symptoms of vomiting and prostration are entirely out of proportion to the severity of the original infection. When death occurs in these cases, it may be that it is due to acid intoxication. If so, it is evident, however, that the original cause of the disease is not acid intoxication and that the acid intoxication is due to some disturbance of the metabolism resulting from a toxemia or from a bacterial infection.

Epidemics of Acidosis. It is because of the occurrence within a short time of a number of cases of acid intoxication of this type, secondary to the infectious diseases, that we have heard so much in the past few years of epidemics of acidosis. It is evident, however, from what we know of the etiology of acidosis, that an epidemic of primary acidosis is an impossibility. When a series of cases of acid intoxication occurs, the explanation is simply that a number of cases of secondary acid intoxication have happened to occur in the course of an epidemic of some other disease. Much attention was attracted, two years ago, by a so-called epidemic of acid intoxication in Concord, N. H. This series of cases has been described by Metcalf. In 70% there was a well-defined infection of the respiratory tract or its adjacent cavities. In the others there was no suggestive etiologic point. A great deal has appeared in the newspapers during the past few weeks about an epidemic of acidosis in Boston and vicinity. I have seen a few of these cases in consultation and have known about a good many others. In the vast majority of these cases no examination of the urine was made. To the best of my knowledge and belief, no examination of the blood, of the ammonia content of the urine or of the carbon dioxide coefficient of the expired air was made in any case. In the vast majority of the cases, therefore, there was no scientific justification whatever for the diagnosis of acidosis. It is probable also that in the vast majority of instances the diagnosis of acidosis had no reason-

able clinical justification. In fact, it is probable that very few of the cases reported as acidosis had acidosis at all. How little basis there could have been for the diagnosis in many instances is evident when we consider, for example, that many of the so-called cases of acidosis occurred in the practice of a physician who, according to the newspapers, saw six hundred cases in his office and made nine hundred house visits in one week. If we stop to reckon how much time he could have given to each visit, it is evident that his examinations must have been very superficial and that the work in his laboratory must of necessity have been very limited. Further evidence of the general carelessness in diagnosis at this time is the fact that three cases were admitted to the Boston Children's Hospital on the same day with the diagnosis of acidosis. One of these children had pneumonia and another appendicitis. The third did have acetone in the urine, but was sitting up and crying for eggs the next morning.

It is true, nevertheless, that some very strange and unusual cases occurred during this period. It is also true that in a number of these cases large amounts of the acetone bodies were found in the urine and that, when these cases recovered, the acetone bodies first disappeared from the urine, while in the fatal cases they persisted. The histories of a few of these cases, which I myself saw are as follows:

CASE 1. A girl, of twenty months, vomited and had loose stools, Dec. 23. She was given bicarbonate of soda and did not vomit for the next two days, but continued to have four or five loose, greenish stools daily. During this time she took only a little barley water. She began to vomit again on the morning of December 26, and continued to vomit constantly from that time on. The movements from the bowels became very frequent and loose. It was impossible to tell how many she was having, however, because she was having treatment by seepage. She was seen at noon, Dec. 27.

She was conscious, but very feeble. She had evidently lost considerable weight. She was a little dusky. The heart was feeble and there were evidences of edema of the lungs. The abdomen was full, but otherwise negative. The liver and spleen were not palpable. There was nothing else abnormal. The urine had not been examined for the acetone bodies. The bicarbonate of soda which she was taking by mouth and rectum was continued and glucose was added to it. She died during the afternoon. There was no autopsy.

CASE 2. A boy, of 28 months, that had been perfectly well and had eaten nothing unusual, suddenly began to vomit at 5 p.m., Dec. 31. He continued to vomit about every fifteen minutes up to the time that he was seen by his physician, two hours later. He was then profoundly collapsed, pale and with cold extremities. The temperature in the groin was 96.4° F. He was given bicarbonate of soda by mouth, but this was vomited. When I saw him at 10.30 p.m. he had rallied a little. His color was good. There was no odor of acetone in the breath. He was conscious, but much prostrated. The phys-

ical examination was absolutely negative. He vomited a little watery mucus during the examination. The urine, which was obtained a few hours later, contained large amounts of the acetone bodies. Bicarbonate of soda and glucose were given by the mouth, but were not retained. He continued to vomit up to three o'clock the next morning. Castor oil and calomel, which had been given during the night, brought away several very large, foul movements about this time. The vomiting immediately ceased and he was apparently rapidly getting well. Twenty-four hours later, however, all the symptoms returned, and he died in a few hours. The autopsy showed a marked general acetone odor of the body. The tonsils were enlarged and contained numerous small foci of pus. The liver was fatty and the kidneys somewhat degenerated. There was marked edema and injection of the brain. Streptococci were found in the tonsils, brain and spinal fluid. They were not found in the other organs or in the blood. Staphylococci were also found.

CASE 3. A boy, nineteen months old, was a little out of sorts on Dec. 27. He seemed all right, however, on the 28th. He had a good stool the morning of the 29th as the result of castoria given the night before. He did not seem very well during the morning, and his physician was called at 2.30 in the afternoon. He prescribed bicarbonate of soda, which was given at once. He vomited about 3 p.m., but not again until 7.30 p.m., when he began to vomit every few minutes and to have loose, watery, foul stools. He was seen at 9.45 p.m. The physical examination was entirely negative. There was no aromatic odor to the breath. He vomited a large amount of watery material several times and had two large, watery stools, slightly brownish and with a very foul odor, during the examination. He continued to vomit and have watery movements throughout the night, and at 6 a.m. the next morning had a convulsion and died. The urine was not examined.

In this instance the symptoms were typical of those of cholera infantum, and at any other time no other diagnosis would have been considered.

CASE 4. A boy of thirteen months, perfectly well, except that he had had a slight cold for several days, began to vomit at 4.30 p.m., Dec. 30. He vomited three times. He was given castor oil at once and thoroughly cleaned out. He was given bicarbonate of soda during the night and repeated enemata of bicarbonate of soda. He was started at once on barley water, to which lactose was soon added. The next day he had many stools, which were not foul. His temperature was 104° F. in the morning, 106° F. in the afternoon and 103° F. at midnight. There was no recurrence of the vomiting. The treatment was continued. He was much better on the morning of Jan. 1, and rapidly recovered. His physical examination was always negative. His breath did not smell of acetone. The urine was not examined. There is no proof, therefore, that this child had an acid intoxication. Acid intoxication would probably not have been thought of at any other time. Nevertheless, he responded to the treatment which has seemed most effectual in this condition, that is, the

immediate emptying of the intestinal tract and the administration of alkalis and carbohydrates.

CASE 5. A girl, sixteen months old, was a little restless on Jan. 21. She began to vomit on the 22d and had two loose stools. Her physician was called on the 23d. He found a considerable amount of acetone in the urine, ordered bicarbonate of soda and carbohydrates by the mouth and gave enemata of bicarbonate of soda. She vomited several times during that day, her temperature gradually going up to 102.4° F. There was acetone in the urine the morning of the 24th. She was seen at 4 p.m. on the 24th. She had evidently lost much weight, her cheeks were flushed and her lips cherry red. Her respiration was rapid and deep. The physical examination was otherwise negative. She was given castor oil and put on barley water with dextri-maltose, while the bicarbonate of soda was continued. She promptly recovered.

Pathology. Little or nothing is known as to the pathological changes in this condition. Degenerative changes have been found in the parenchymatous organs, but nothing in any way pathognomonic. In two cases in which this diagnosis had been made, which were examined recently in Boston by Dr. Magrath, the bodies both had a marked acetone odor, the tonsils showed definite evidences of infection in both, the livers were fatty and the kidneys somewhat degenerated. There was marked edema of the brain in both instances. Streptococci were found in the tonsils, brains and cerebrospinal fluid in both. In one the staphylococcus aureus was also present. No bacteria were found in the other organs or in the blood in one case, and no cultures were made from the other organs in the other case.

Treatment. The cause of the symptoms in acid intoxication being the withdrawal of bases from the organism as the result of an excess of acids in the system, it is evident that the treatment indicated is the introduction of alkalis into the system to neutralize the acids in the body and in this way to prevent the further withdrawal of bases from the body and to allow the reaccumulation of the bases which have been abstracted from the body. The best alkali to use is the bicarbonate of soda. This may be given by the mouth, by the rectum, subcutaneously or intravenously. It is preferable to give it by the mouth if it can be retained. It is best given in water, but, if desired, the taste may be disguised by orange juice or grape juice. It is seldom wise to make the concentration of the solution stronger than 1:20. It is usually better to make it 1:30 or 1:60. Stronger solutions are almost certain of themselves to cause vomiting. The general feeling is that as much soda should be given as possible. It is very probable, however, that excessive amounts of soda may of themselves cause vomiting and diarrhea, and perhaps poisoning. I am very confident that in a considerable number of instances in which I have

been called in consultation to see cases of supposed "acidosis," the vomiting and diarrhea were the result of excessive doses of bicarbonate of soda and not symptoms of acid intoxication. In one instance of which I know, in which a baby of fourteen months received three ounces of dry bicarbonate of soda in twelve hours, the baby was collapsed and almost moribund, apparently as the result of the large amount of soda. Other alkalis may be used, but are, as a rule, not as satisfactory as bicarbonate of soda.

Bicarbonate of soda should also be given by the rectum. The solution may be stronger when it is given in this way. The solution is more often retained when it is given by seepage than by enema. Seepage is, in my experience, the more satisfactory method. The solution used for seepage should ordinarily not be stronger than 1:10. It is, of course, useless to attempt to give soda by rectum when there is diarrhea.

When bicarbonate of soda is given subcutaneously, a 2% solution should be used. When given intravenously, a 4% solution is strong enough. The amount to be given must depend, of course, on the age and size of the patient.

The acetone bodies being formed chiefly from fat in the absence of carbohydrates or when there is a disturbance of the carbohydrate metabolism, another indication is to administer an easily absorbable and utilizable carbohydrate. Such a carbohydrate is glucose or dextrose. This may be given by mouth or by rectum. It is usually advisable to give the soda, both by mouth and by rectum, in a 10% solution of dextrose. In urgent cases dextrose may be given intravenously in the strength of 2½% of dextrose in normal saline solution. Kahlbaum's is the only readily available pure dextrose. When the vomiting stops and the patients begin to improve, the carbohydrates may be added in the form of the cereal waters or jellies, to which one of the various maltose-dextrin mixtures or lactose may be added.

Practically, the usual treatment is the administration of a 5% or 10% solution of bicarbonate of soda in a 10% solution of dextrose freely, both by mouth and rectum. In my experience the immediate and thorough cleaning out of the intestinal tract has seemed to have more effect on the outcome in those cases of acid intoxication secondary to infections or to diseases of the intestinal tract than any other single procedure.

It must be remembered that this treatment is simply for the condition of acid intoxication, and that this condition is not a primary, but a secondary one. Therefore, even if the condition of acid intoxication is relieved, the original causative disease remains. The patient may die, therefore, even after the acid intoxication is cured.

THE FREQUENCY OF EPILEPSY IN THE OFFSPRING OF EPILEPTICS.*

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The present paper is an attempt to determine the extent to which epilepsy is transmitted directly from parent to offspring. In order to secure available data for this work, the records of 1536 patients, whose epilepsy had brought them under the care of the Monson State Hospital, were examined. Of these, 236 had been married, but in only 175 were the records and available information sufficient to render them suitable for study, and it is this latter group which forms the basis of this paper.*

One hundred and thirty-eight of these marriages resulted in one or more offspring, while the remaining 37 were sterile. Eighty-nine were females, 81 were males. The total number of children born of these 138 marriages was 553, an average of four to each mating. Only the epilepsy in these offspring was recorded, no consideration being made of other mental or nervous disorders at this time.

Before beginning my discussion I would call attention to some of the statements in the literature regarding heredity in epileptics. Spratling¹ found epilepsy as a hereditary factor in 16% of his cases; Doran² in 19.3%; Binswanger³ in 11%; Dejerine⁴ in 21.2%; Turner,⁵ in a study of 676 cases, finds 37.2% with an epileptic heredity, but Turner's figures include both direct and collateral heredity, as a further analysis of his cases show that only about 20% was transmitted from parent to offspring. Turner further states: "The most common cause of epilepsy is ancestral epilepsy." It is not surprising to find that Turner's private cases showed more epileptic heredity than his hospital cases, the former revealing epilepsy in 46.7% in the ancestors and collaterals, and the latter 35.9%. This is accounted for by the more complete family histories in the private cases.

With just a word we may dismiss the group of 37 cases without children; they represent a little over one-fifth of the entire group; so that we can say, roughly, that one out of every six (236-1536) of our new admissions was married, and 80% of these marriages resulted in one or more offspring. In 18 of these 37 cases the convulsions began previous to marriage; in 19 cases they began after marriage. Of this latter group 10 were males and 9 were females.

The remaining 138 cases, with histories of their ancestors and a careful study of the mental and social condition of their offspring, might well serve as the nucleus for a volume on epileptic heredity, but this would require the services of one or more social and eugenic workers for a long period of time. I appreciate that this paper will have no such value as one worked out with the aid of a social worker, yet I can-

not but feel that it may stimulate some interest in the study of the patients confined in our institutions.

Aldren Turner,⁶ quoting Gowers, states: "It is less easy to obtain a hereditary history as life advances and the preceding generation passes out of the reach of questions."

To what extent the innocent heir to an epileptic predisposition can control those environmental factors which would act as the exciting cause of a life-long malady, rendering the patient a burden to himself, his family and society at large, is only one of the many problems which the study of the offspring of the insane and epileptic presents.

In this paper I can state only my findings in this rather small series of cases, appreciating that it will have only a relative value. If it be that my views lean rather toward optimism than pessimism for the outlook of those predisposed by their ancestors to epilepsy, I am sure they will not more than neutralize some of the gloomy forecasts sent abroad by those who label every headache migraine, all muscular spasms epilepsy, and every man who takes a glass of beer an alcoholic.

The group of married cases which have been retained for study are further divided:

Total number of married cases retained for study	138
Epilepsy before marriage	47
Males	16
Females	31
Epilepsy after marriage	91
Males	52
Females	39

The average duration of the epilepsy in the 47 cases having convulsions before marriage was 11.9 years in males, and 8.1 years in females; while the average number of years elapsing between the marriage and the epilepsy in the 91 cases where the convulsions came on after marriage was 14.6 years in males, and 12.4 years in females. Of the 39 females having their first convulsion after marriage, pregnancy was the exciting cause in 12 cases (30.8%). There is no one exciting factor among the males that gives such a corresponding high percentage as pregnancy in the females.

Another point worthy of note in this study is the fact that nearly twice as many females as males marry with the knowledge of their epilepsy. Doubtless it is easier for a woman to conceal the fact of her epilepsy under the guise of menstrual disorders, fainting spells, hysteria, etc., as her social condition confines her more closely to the house, where she is less likely to be observed during a convulsion. The large number of cases coming on after marriage in males includes, without doubt, many cases where arteriosclerosis and alcohol were the exciting factors. So it may be said that the only incident in married life that would be likely to act as an exciting cause of epilepsy would be pregnancy.

* Read before The New England Society of Psychiatry, Waverley, Mass., September 28, 1915.

As previously stated, the total number of children born in consequence of these 138 marriages was 553,—309 males, and 244 females. It is with the epilepsy in these offspring and no other mental or nervous disorders that this paper is concerned. Collateral and dissimilar heredity will receive nothing more than mention at this time.

In the entire group (138 cases) direct-similar heredity in parents was found in only 8 cases, viz.,

Mother alone	3 cases
Father alone	4 "
Mother, maternal grandmother and maternal great grandmother ...	1 case

Therefore, it will be seen that only 5.8% of the ancestors of these patients had epilepsy. It may also be stated at this time that only one of these cases with epileptic heredity had epileptic offspring.

The personal histories of the offspring were obtained by various methods. In some instances the patients themselves, or their relatives and friends, were able to give information that was very satisfactory in personal interviews; while in the other and more numerous cases the desired information had to be obtained by means of correspondence. First, a printed blank was sent to every desirable case, asking for detailed information concerning the patient and patient's children. It was necessary in some cases to follow up the blank with a personal letter in order to clear up some obscure point. Then, with the information in their records, the data was compiled. Appreciating that the information obtained by such a method is subject to many sources of error, I have made no attempt to determine nervous or mental derangement other than the epilepsy in the offspring.

The epileptic convulsion, with its clinical features and the sequela, is a phenomenon that cannot easily pass unnoticed even by the most unobserving. Therefore, the method adopted (not by reason of choice, but because there was no other available at this time) would be more applicable to the study of epileptics than of feeble-minded or insane, as the mental status of the informant would not be of such importance in determining the question of convulsions as it would in determining the mental status of another.

Of the 553 offspring resulting from the 138 marriages where one of the parents was an epileptic, it was possible to obtain a history of convulsions in only 10 of these children. In two instances there were two children having convulsions in the same family; so that in only 8 of the 138 matings has the epilepsy made itself manifest to the present time. Six of these epileptic offspring died in early infancy of convulsions, leaving some doubt as to whether they would have become confirmed epileptics; of the remaining four the age at onset varied from the second month to the fifteenth year; the youngest

offspring where information was received was four days old, the oldest fifty-five years. There are still about 225 children who are under 20 years of age; that is, they are still in the zone where 75% of the epilepsies begin; but only 6 of these are under one year of age and 16 between the first and fifth years, while the majority are between the fifteenth and twentieth years of life.

Gowers⁷ states: "More than a quarter of all cases begin under the age of 10 years; nearly half between 10 and 20; about one-seventh between 20 and 30; one-sixth between 30 and 40; about 2½% between 40 and 50; 1% only between 50 and 60; after which 0.5% only occur; 74% of the total number of cases begin under 20."

It would hardly be worth while at this time to make any conjectures as to what the probable outcome of these epileptic offspring will be. Much will depend upon the environmental conditions and external factors with which they come in contact. Rickets, gastro-intestinal diseases, infectious disorders, head injuries and alcoholism are only a few of the shoals upon which the predisposed might be wrecked.

In the cases past 20 years of age, the chance of their becoming epileptics, although a factor to be considered, is comparatively less than in the younger group. It is my opinion that heredity will not play a very important part in the epilepsy of those 328 individuals now over 20 years of age.

Spratling⁸ states: "The average age at onset in cases with epileptic family histories was 10 to 17 years"; and, in a recent study, I⁹ found that in 157 patients with heredity the average age at onset was 11 years. Although I know of no reason why hereditary defects might not lie dormant in an individual two or more decades before making themselves manifest, yet such a history is comparatively rare. (See table).

From this table it will be noted that six of the offspring were congenital epileptics, all of them dying in early infancy from convulsions. Two of the cases are arrested: the offspring of A. D. had convulsions at four years of age and has had none since, is now 21 years of age; the offspring of E. T. had convulsions between the second and seventh years and has had none since, is now 43 years of age. The offspring of E. B., and L. P., the two remaining cases, are confirmed epileptics, one being confined at Monson State Hospital, the other at Hospital Cottages for Children in Baldwinville. All the cases excepting one, E. A. T., developed their epilepsy after marriage, from one to 31 years elapsing between the marriage and the onset of convulsions. The exception (E. A. T.) began having convulsions at 14 and was married at 27.

In three cases, P. P., C. D., and E. T., the offspring had convulsions before the parent. In only one case, L. P., was there any history of direct heredity, and in only two cases could an exciting cause be isolated, both being attributed

Name of Patient.	Hereditary.	Exciting Cause.	Relation of Epilepsy to Marriages.	History of the Epileptic Offspring.
P. P.	None	Trauma	Epilepsy 9 years after marriage.	Two children died in infancy from convulsions, exact age not given. (Only two children.)
C. D.	None	Trauma	Epilepsy 9 years after marriage.	Two congenital epileptics—both died from convulsions. (Five boys and five girls.)
A. D.	One sister epileptic	None	Epilepsy 3 years after marriage.	Youngest had convulsions between the fourth and fifth years—none since—present age 21. (Two boys and three girls.)
E. T.	None	None	Epilepsy 31 years after marriage.	Oldest had convulsions between the second and seventh years—none since—present age 43. (Two boys and six girls.)
E. B.	None	None	Epilepsy 1 year after marriage.	Oldest child has had convulsions since thirteen years—is now seventeen—confined to Baldwinville. (Three boys.)
E. S.	None	None	Epilepsy 3 years after marriage.	Second child died in convulsions at the end of first week. (Three boys.)
L. P.	Mother epileptic	None	Epilepsy 24 years after marriage.	Youngest had convulsions which began at fifteen years. (Two boys and four girls.)
E. A. T.	None	None	Epilepsy 13 years before marriage.	Oldest died at fourth month during a convulsion. (One boy and one girl.)

to head injuries. The case, P. P., has since come to autopsy, but there was no evidence to indicate that trauma might have caused the epilepsy.

SUMMARY.

1. The records of 1536 epileptic patients admitted to the Monson State Hospital, showed that one out of every six was married.

2. Eighty per cent. of the marriages resulted in children.

3. One hundred and thirty-eight marriages resulted in 553 offspring, an average of four to each marriage.

4. Of the 553 offspring it was possible to obtain a history of epilepsy in only 10 cases (1.8%).

5. Of these 10 epileptics, 6 died in infancy, two became confirmed epileptics, and two cases are arrested, one for 17 years, the other for 36 years.

6. The study of the family history in 138 epileptics revealed epilepsy in one of the parents 8 times, and the study of the offspring of these same patients showed that it had been transmitted 10 times; but in two instances there were two children in the same family who had convulsions, so that the epilepsy was inherited and transmitted in 5.8% of the cases.

7. These figures correspond more closely with the recent work of Stuchlik,¹⁰ who found inheritance of epilepsy in epileptics direct from parent in 4.1% of 176 cases, than they do with the findings of Turner, Doran and Binzwanger.

8. From the above it would appear that epilepsy is transmitted directly from parent to offspring less frequently than we have heretofore been led to believe.

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Clinical Department.

FALSE ANEURYSM OF BRACHIAL ARTERY.

By D. PEARCE PENHALLOW, M.D., BOSTON.

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ANEURYSMS are always of interest and probably more especially so at the present time when there are so many caused by implements of warfare. Even very small pieces of flying shell may damage the blood vessels, as is illustrated by the following case:

T. M., age 24, private in the 5th Sherwood Foresters, was wounded by an exploding shell on October 14, 1915, while making an advance at Hulluch. He was admitted to the American Women's War Hospital on October 19. Examination at that time as follows: Well developed and nourished man, in considerable pain. General physical examination: Negative, save as follows: Right upper arm and forearm very much swollen, upper arm tender and markedly ecchymosed. Over inner edge of biceps, about 1 inch from median line and about junction of middle and upper thirds, is a small wound 3/16 of an inch long by 1/8 of an inch wide. No foreign body can be felt. Thumb and index finger hypersensitive; sensation in other fingers normal. Patient cannot extend or flex fingers. X-ray

(Fig. A) shows minute foreign body in location of wound. Circulation of forearm and hand good.



FIG. A.—X-ray print of arm. Shows minute piece of shell below A. Foreign body shows only as a small dark line as the object was presented edgewise.

Nov. 1. Arm has been baked daily and also treated with dry heat. Swelling has now disappeared, but a distinct thickening may be felt along the course of the brachial vessels, suggesting a thrombo-phlebitis. Considerable tenderness along this region. Radial pulse good, not irregular. Patient complains of marked hypersensitiveness of all fingers, also shooting pains in arm, and is unable to bear any pressure on fingers or dorsum of hand.

Nov. 20. Thickening along course of artery still persists. At a point 2 inches below tendon of pectoralis major and at inner side of biceps at a point corresponding to the level of the wound is a small area $1/2$ inch in diameter, over vein, which pulsates with a forcible and visible impulse, but no thrill can be felt. On auscultation a distinct, though faint, bruit may be heard.

Nov. 25. Area on inner side of biceps the same as at last note. On inner edge of triceps at a point slightly higher, is an indurated area 1 inch in diameter, pulsating (transmitted impulse?) and over this area can also be heard a bruit of a lower note than



FIG. B.—Photograph of arm just previous to operation. Shows a small discoloration just under letter A, which is the wound of entrance. B, pulsating tumor mass. The curious discoloration of upper aspect of arm is a tattoo mark.

that in the original area. No edema of arm. Pain practically the same.

December 1. Tumor mass distinctly larger than at last note (Fig. B). Distinct bruit over whole area occupied by tumor mass with a distinct palpable and visible impulse. Immediate operation deemed necessary.

Dec. 2. Operation; ether. Incision made in axilla. Dissection carried down through brachial plexus and first part of axillary artery identified and freed. Crile clamp applied to control hemorrhage. Incision was then carried down over tumor mass. Deep tissues found edematous, and, owing to the absorption of the old hematoma, there was very much scar tissue which made dissection very difficult, as structures and tissues could not be easily recognized. Tumor mass dissected free. A minute piece of shell (Fig. C.) found adherent to

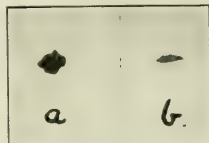


FIG. C.—Photograph of shell fragment removed at operation. Photograph shows actual size of fragment. (a) Shape and outline of fragment; (b) its thickness.

and penetrating the wall of the brachial artery. Distinct capsule found on tumor mass (Fig. D). This was opened and a considerable amount of organizing blood clot was evacuated. A tear of considerable size was found in the brachial artery,

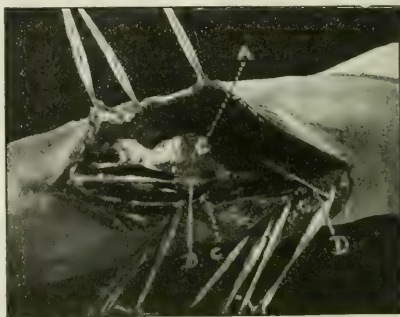


FIG. D.—Photograph taken during operation after the tumor mass A, had been exposed. B shows a vein running across the tumor mass. C, the fascia, and D, Crile clamp, which was placed on the axillary artery.

and the basilic vein also was torn. It was not possible to suture the tear in the artery, so both artery and vein were tied above and below the wound. The artery was probably tied above the profunda branch, which could not, however, be identified. The median nerve was found bound down in scar tissue and freed. Wound closed in layers, rubber dam drainage. Good ether recovery.

Dec. 6. Following operation, hand and forearm have been somewhat cyanotic, very little edema. Pain in hand has been apparently the same until today, when it disappeared. Today hand of good color, warm and not hypersensitive. Perceptible

radial pulse can be felt. Wound dressed, healing by primary union.

Dec. 20. For the past two weeks patient has been making an uneventful convalescence. Wound healed by primary union. There is considerable pain, although not so severe or so frequent as formerly. Pain now localized to thumb and index finger.

Jan. 1. Patient has been having daily massage and passive motions of fingers. Movements of fingers and arm are increasing. Pain has practically gone. Tips of index finger and thumb feel numb. Color of hand and fingers good. Good radial pulse. Patient transferred to 4th London General Hospital for electrical treatment.

It is interesting to note the very small size of the fragment of shell which caused so much damage. Apparently what took place was that the vein and artery were both punctured by the entrance of this piece of shell, which caused a large and constant amount of hemorrhage into the arm. As the arm became tense, the hemorrhage was decreased, and as the hematoma began to absorb and scar tissue was formed, the tumor mass, or blood clot, became more localized, and in localizing formed a false aneurysm.

Medical Progress.

REPORT ON DERMATOLOGY.

By JOHN T. BOWEN, M.D., BOSTON.

(Concluded from page 539)

HUMAN SERUM AND BLOOD IN TREATMENT OF PSORIASIS AND OTHER SKIN AFFECTIONS.

At the meeting of the American Dermatological Association for 1915, two papers⁵ on this subject were read: one by Howard Fox, the other by Trimble and Rothwell. Neither of these writers was able to see a hopeful future for this, so far experimental, method of treatment. Fox stated that up to the time of writing, sixty patients suffering from different forms and stages of psoriasis, had been treated by a combination of chrysarobin ointment and injections of autogenous serum, three hundred injections in all being given. From this experience Fox is able to uphold his former statement that serum when used alone is of no value, but that it somewhat accentuates the action of the chrysarobin. He states that it is possible that the good results are due not to the serum, but simply to the blood-letting, or even, as has been suggested by others, to the increased vigor and enthusiasm with which the new treatment is carried out. In any event, this treatment does not prevent the appearance of relapses, which occurred in the usual percentage of cases. The results in some of his cases were partial or com-

plete failures, in one case, however, the eruption disappearing after several months after cessation of treatment, which shows how the affection sometimes disappears spontaneously. In these cases an autogenous serum was used. In twenty-one other cases of skin diseases, mostly of a pruriginous character, both autogenous and heterogenous serum and blood were used, and these were chiefly cases that had proved resistant to the older methods. In most of these cases the results were very unfavorable, the best results being in dermatitis herpetiformis, where they were very satisfactory. Seven cases of this affection were treated, one a woman of eighty, who had had the bullous form for three months. Injections extending over a period of six weeks produced a gradual but steady improvement of both subjective and objective symptoms. No local treatment was used except vaseline to soften the crusts. In three of the cases the results were unsatisfactory. There was no benefit recorded in four cases of eczema, nor in two cases of lichen planus, while one out of three cases of chronic urticaria showed gradual improvement. There was also improvement in a case of prurigo. No ill effects were noted from these different experiments. The injections of autogenous serum were followed by no disagreeable effects except that one patient with psoriasis complained of general malaise for twenty-four hours and had a slight rise in temperature. There were, however, occasional anaphylactic symptoms lasting two or three days from the injection of heterogenous serum and blood, and after intramuscular injection of blood there was considerable discomfort lasting often for some days. His conclusions are that injections of autogenous serum alone have no effects on psoriasis, but when given with chrysarobin, better results seem to be attained in certain cases than when chrysarobin is used alone, and this may be due to the blood-letting or the greater enthusiasm for the new method. In other skin diseases, with the exception of dermatitis herpetiformis, the results are disappointing. There is no danger in the method.

Trimble and Rothwell state that the claims based on this treatment are either that the serum injections alone cause the disappearance of the lesions, or that the psoriatic foci are so sensitized by the serum that a weak external application (chrysarobin 2%) can easily remove them, the same lesions being resistant to strong external agencies, without the serum injections. The only theory or reason given is that probably some change takes place in the serum outside of the body. For the study of this question, fifty cases of psoriasis were selected: thirty of these were given the serum treatments, the remaining twenty being used as controls. The controls were divided into two groups of ten each, one grouping being placed on 2% chrysarobin ointment, and the other on 10% white precipitate ointment. Each patient who took the serum injections was given an ointment of 2% chrysarobin.

bin after the sixth treatment, but as far as possible the injections were continued until the total number reached ten.

In twenty-eight of the thirty patients who received the serum injections, there was absolutely no change in the skin appearances before the ointment was applied; after that there was a fair rate of improvement.

As to the controls, they seemed to progress if anything more quickly and favorably than the injection cases, but this of course may have been a coincidence. It was surprising to find that a 2% chrysarobin ointment seemed to act as effectively, and to produce a dermatitis as readily as a 10% ointment. In one young woman, this 2% ointment produced an intense dermatitis. The injections were given at weekly intervals, and active serum was used in every case.

The writers' conclusions are that autogenous serum injections alone are worthless for the cure of psoriasis, and that autogenous serum as an adjunct to weak chrysarobin ointment seems also worthless, as a patient who does not take the serum will improve as fast with the ointment alone. In typical uncomplicated cases the patches show no improvement until the external application is begun. Nevertheless this method is harmless when suitable antiseptic precautions are taken. But they believe that many patients who have been affected for years with persistent or frequently recurrent attacks of psoriasis, become discouraged or lax in the treatment, and are so stimulated by the idea of the new treatment that they devote themselves to it vigorously, and in this way derive more benefit from it.

In the discussion that followed the reading of these papers, several of the members recorded their belief that the autoserum therapy had some definite value, although only one expressed himself with anything like enthusiasm. Several had tried the method with absolutely negative results. There was further testimony as to its value in some cases of dermatitis herpetiformis.

LESSENERED RESISTANCE OF THE SKIN.

Brocq⁶ rightly considers that this feature of diminished cutaneous resistance, although a phenomenon heretofore recognized and described, needs further elaboration and emphasis owing to the position it occupies in general cutaneous pathology. He attacks this question, however, wholly from the clinical point of view, leaving aside all hypotheses and theories.

In a general way, an individual's skin may be said to have a lessened power of resistance, when it does not act like those of the great majority of individuals in presence of irritants of every moderate intensity. Therefore, when this power of resistance is lost, agencies which would not produce any harmful effect when the power of resistance was normal, are capable of giving rise to various cutaneous lesions. The diminution of resistive power may be general, or re-

gional. When *general*, it is illustrated by congenital epidermolysis bullosa, where traumatism, at least in early life, may produce bullae on any part of the body. So, too, when a susceptibility to one or another substance, such as a preparation of mercury for example, has been established, irritation may be produced on any part of the body that has been in contact with the agent. When *regional*, the lessened power of resistance of certain places almost always follows traumatisms that have affected these regions. These traumatisms may be of almost any nature: prolonged contact with atmospheric agents, irritating agents of various kinds pertaining to professions, as surgeons, dentists, grocers, masons, plasterers, dyers, etc.; or to agents that are used in the toilet, such as soap, perfumes, cosmetics, depilatories, etc. These agents usually act slowly, producing at first light, later more severe, lesions. The normal power of resistance of the cutaneous tissues is gradually lessened, until at length a very slight cause may produce lesions. In order to get back to the normal state, it is necessary to keep the enfeebled part free for a long time from every kind of irritant, however slight. Sometimes, however, the lessening of the power of resistance is brought about suddenly by a violent traumatism, at a stroke, such as severe exposure to the sun, extremely irritating applications, etc. These localized diminutions of resistant power show how complicated this question of lessened power of resistance is in general, from the pathogenetic point of view. They show that it cannot be regarded as a simple matter of anaphylaxis.

The selfsame irritating agent, as the sun for instance, may act on tissue in a state of lessened power of resistance in a very varying manner. Thus, in the case of xeroderma pigmentosum, the effects of the rays are felt in all the cutaneous parts, epidermis, pigment, corium, vessels and glands. The same is true of hydroa vacciniforme. In other cases, the sun produces either a simple erythema, an erythema with desquamation, or simply an increase of pigmentation. Moreover, to show the complexity of the subject, a congenital diminution of resistancy may persist during life, as in hereditary epidermolysis bullosa, which usually occurs in families, xeroderma pigmentosum, etc., or it may become less marked with age, and even end by disappearing.

There are cases sufficiently numerous in which an irritant causes at first eruptions of a purely traumatic type, which are gradually succeeded by those of a special type, such as an urticaria, a true vesicular eczema, a papulo-vesicular eczema, etc. An instance cited is that of a woman of forty-five, who suffered from an artificial vesicular eruption of the scalp, face, and neck caused by a dye used for her hair. Thereafter the least irritation, from cold, from heat, weather, or digestive disturbance was sufficient to cause erythematous and oedematous outbreaks on the eyelids, ears, and adjacent parts. The

artificial eruption had created on the parts of the skin affected, *loci minoris resistentiae*, and upon these places the slightest irritating cause was sufficient to bring out an eruption. In subjects who have been either thus rapidly sensitized by effects less active, but prolonged and repeated, the skin sometimes ends by not bearing any contact, and agents that are apparently most inoffensive may be enough to provoke violent outbreaks.

May not this conception of diminished resistance of the tissues be extended to certain eruptions of internal origin, caused by the ingestion of harmful substances? It is known that antipyrine in certain people causes erythematous, or erythemo-bullous eruptions, which appear always at the same places. Each time the drug is taken, a predisposed person sees all the places that have been previously affected become the seat of a new outbreak, usually still more intense than the former ones, but often affecting places not hitherto attacked. Therefore, there seem to be places in which the normal resistance of the skin is lessened, and that under the repeated action of the toxic substances, these places are progressively multiplied. Of late, the attempt has been made to explain these phenomena on the new theory of anaphylaxis; but with this the writer does not attempt to deal, occupying himself with the diminution of power of resistance caused by external agents.

Brocq cites cases to show that the introduction of a toxic substance into the system, may greatly favor the appearance of lesions associated with a diminution of the resistant power of the skin; but it does not prove that the introduction of this substance creates this diminished power of resistance. Such was the case of a woman who had used very irritating applications to her breasts, at the same time that she was having injections of arsenic. The irritating applications caused a *locus minoris resistentiae*, upon which pigmentation from the arsenic established itself to a very intense degree. Hence he concludes that influences of internal origin may modify the normal resistance of the tissues, as renal insufficiency, gastro-intestinal fermentations, disturbances in the functions of the vascular glands, etc., as well as nervous shocks. Climate may also be a factor. The quality of these eruptions and their morbid aspect are independent of the degree of resistance of the skin and of the external traumatism; they depend on individual idiosyncrasy and numerous occasional causes, which act upon the system at the moment when the attack occurs: if there has been an irritating action from food, it will be an urticaria; if renal insufficiency and intestinal fermentation, it will be a papulo-vesicular eczema; if there has been an excess of nitrogenous food, a psoriasis or parakeratosis.

The most important indication for treatment is the suppression of every external irritating

action on the skin tissues, so that they may regain their strength, and their normal power of resistance; a danger is the natural tendency that patients have to resume their occupations, before the skin has regained a sufficient resisting power. Next must come the endeavor to discover and remedy, any systemic disturbance, which may be aiding the diminution of resisting power of the integuments. But above all, it is needful to prevent exposure to the traumatisms that have been the cause of the diminution of resistance; and this, unfortunately, means in many cases changing a patient's duties or profession. When the latter is not a feasible course, the best possible must be done with the aid of palliatives.

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Book Reviews.

The Untroubled Mind. By HERBERT J. HALL, M.D. Boston and New York: Houghton-Mifflin Co. 1915.

Dr. Hall is well known for his articles on the treatment of neurasthenia and other functional nervous disorders, and this book, small as it is, shows the result of years of experience in both the study and treatment of these disturbances. Not an elaborate psychological analysis of functional nervous disorders intended for the use of specialists, it yet shows the marks of a profound psychological knowledge of these troubles. Written in clear and untechnical language, the reviewer knows of no book, unless it be the one by Dr. J. W. Courtney, more useful to put into the hands of an intelligent patient, as an aid to the necessary understanding and self-control required in the treatment of the neuroses. The titles of the chapters: *The Untroubled Mind; Religio Medici; Thought and Work; Idleness; Rules of the Game; The Nervous Temperament; Self Control; The Lighter Touch; Regrets and Forebodings; The Virtues; and The Cure by Faith*, give one some faint insight of the method of handling the subject, though not of the steady poise of mind, and sanity in the writer's treatment of it, which is a welcome contrast to so many of the books recently appearing in the field of the treatment of the neuroses, so often a mixture of incorrect psychology, lack of understanding of the neuroses, and of sentimentality, and pseudo-religion.

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MASSACHUSETTS MEDICAL SOCIETY.

THE ANNUAL MEETING.

THIS year the annual meeting of the Massachusetts Medical Society will be held in the Copley-Plaza Hotel, Boston, Tuesday and Wednesday, June 6 and 7. With an active and efficient Committee of Arrangements, and assiduous Committee on Scientific Papers and officers of the Sections, the program should interest a large number of the Fellows. The Section of Surgery will present a symposium on fractures, calling together the leading experts hereabouts and also one or two noted men from a distance. The Section of Medicine will consider the subject of the Allen treatment of diabetes and will have papers on acidosis and on nephritis, in an attempt to bring the latest ideas on these subjects to the general practitioner. The Section of Tuberculosis has arranged for papers on tuberculosis and syphilis, tuberculosis carriers, and what constitutes

clinical tuberculosis in adults. The Council and Society, at their business meetings, will consider amendments to the by-laws having to do with the date at which dues must be paid in order to count towards the dividends to the district societies; as to adding to the membership of the Council the ex-presidents and the librarian; and concerning the time for holding the annual meeting of the Society. The Council will hear the reports from the standing committees, elect officers, orator and committees, and transact the business of the Society.

Tuesday evening the Shattuck Lecture will be given by Dr. Theodore C. Janeway, of Baltimore, followed by a reception to the president, and music and refreshments. The literary exercises of the meeting of the Society on Wednesday morning will consist of a series of short papers on the contagious diseases of childhood by prominent specialists of the Society and by several from other states, ending with the annual discourse by Dr. David L. Edsall, of Boston. Wednesday afternoon has been set aside for a combined meeting of the Sections of Surgery and of Medicine at the Peter Bent Brigham Hospital on the subject of exophthalmic goitre, with a good array of readers and discussers. In the evening the annual dinner gives promise of being as much of a success as last year, judging by the speakers who have consented to speak and from the proved ability of the president as a presiding officer.

It is to be hoped that a great many Fellows will attend the different meetings and thus gain the advantages not only of hearing the papers and discussions but, by touching elbows and exchanging views with their brother practitioners, promote that sociability for which, in part, the Society was founded.

SOME INCIDENTS IN THE LIFE OF BARON LARREY AFTER THE OVERTHROW OF NAPOLEON.

It is but natural that all those who were the closest to Napoleon during the Empire should be viewed with disfavor in the new order of things, no matter how much they may have accomplished, and Larrey suffered no inconsiderable hardships in the first years after his leader's exile.

Stewart gives us in his "Lives of the Paris Surgeons" an interesting account of some of

these hardships which were luckily to last only for a time. As soon as the news of Napoleon's death was received in France, some of Larrey's justly and hard-won honors were given to him again.

For a time, Stewart tells us, Larrey was removed from every post he had so honorably filled under the government, and his pension was also taken from him. One position only was left him, that of Surgeon to the Hôpital de la Garde, and this was not taken from him simply because the authorities feared the comment of the soldiers if Larrey was banished. He said at this time, "My existence is uncomfortable and full of reverses and misfortunes. To these irreparable losses was to be added that of all my revenues, including a pension of 3000 francs which had been granted me by the Emperor Napoleon as a recompense for the services which I had rendered to the wounded after the memorable battles of Lutzen, Bautzen, Wurchen and Wagram."

Stewart tells us that at this time Larrey's fortunes were so low that he despaired of repairing them in France and almost yielded to advice to seek his future in the United States. The Emperor of Russia at this time made him a most flattering offer to appoint him Surgeon-in-Chief of his armies, but patriotic ideals kept him from this step. Much of his time was now spent in literary work and the writing of parts of the famous history of his campaigns under Napoleon. One of his most precious remembrances is said to be that concerned with Napoleon's last hours at St. Helena when he spoke of "The Virtuous Larrey."

Shortly after this time Larrey had his honors restored to him, at least in part, and he was enabled to make a long-wished-for trip to England, where he was the guest of Astley Cooper, and enjoyed ample opportunity for seeing the practice of the representative surgeons in England and Scotland. He wrote a treatise, on his return to France, comparing the surgical methods of the two countries.

In the revolution of 1830 he was again active as a military surgeon and was decorated by Louis Phillippe for his great services on the field.

After this, Stewart tells us, the King of the Belgians asked him to go through the military hospitals of that country and superintend the different *ambulances*. This he did in the thorough manner that might be expected. After

this he was enabled to rest somewhat, and traveled in his native country and in Italy. In almost every place he passed through were some of the soldiers of the Imperial Guard, and these old campaigners were overjoyed to see him again. Some of them, though crippled, walked for miles to see him and followed his carriage for long distances so as to keep sight of him as long as possible.

He had at this time seen more military service than any living man. For fifty-three years he was with the army, and was in twenty-one single and five double campaigns, which were the scenes of many deeds of heroism on his part. The only wound that Napoleon ever received was treated by Larrey, and this was not a battle wound, properly speaking, but was due to a kick on the instep from his own horse. This was not even serious.

After a brief trip to Africa, where Larrey inspected the military hospitals, he returned to France and was taken ill at Lyons, where he died on the twenty-fifth of July, 1842. Thousands of persons attended his burial, and to the soldiers of the Guard his death was a calamity second only to that of Napoleon himself. To all his compatriots it was a source of great pleasure to feel that his last days were peaceful and that the honors he so richly deserved had been restored to him.

W. P. C.

ST. BARTHOLOMEW'S HOSPITAL.

IN another column of this issue of the JOURNAL we publish a communication from one of our special foreign correspondents, to which we wish to call attention, narrating the recent experiences of an American medical student, a Rhodes scholar, at St. Bartholomew's Hospital, London, during the present war. This letter pictures vividly the modern conditions of this ancient institution and recalls its past in a way that contrasts strikingly with the circumstances of today.

In this connection we may call attention also to the Rede lecture, founded by Sir Robert Rede, a chief justice of common pleas in the reign of Henry VIII, to be delivered annually at the Senate house in Cambridge, England. On May 6, 1915, this lecture was delivered by Dr. Norman Moore on the subject of "St. Bartholomew's Hospital in Peace and War." Dr. Moore emphasized particularly the frequent experi-

ences of war which have fallen to the lot of this oldest of London hospitals:

"The first warriors known to have come into any relation with the hospital were the witnesses of a charter of Henry I, who afterwards took part in the wars of Stephen's reign. The next contest in which some of the actors came into the affairs of the hospital was that which ended in the grant of Magna Charter. The war between France and England at the end of the reign of John and the beginning of that of Henry III was connected with the subsequent tumults in London, which ended in the execution by Hubert de Burgh of Constantine Fitz-Alulf. Constantine himself, as he spent his last night in the Tower, in August, 1222, apprehensive of danger, but not knowing he was to die next day, most likely drew up the charter of benefaction to St. Bartholomew's, of which a copy had been preserved. In the following century the staff of St. Bartholomew's saw Wat Tyler's mob in Smithfield. Wat himself was pulled through the hospital gate as he was dying. The first hospital steward after the Restoration had fought in the defence of Basing House, and some wounded sailors of the second Dutch war were taken into the wards."

During the present European War, St. Bartholomew's has well lived up to its reputation for patriotic service, since it provides constantly over 200 beds for wounded soldiers, and as the School has contributed over 1000 men who have held commissions in the combatant or medical services.

LONGEVITY OF PHYSICIANS.

It is generally supposed, not without reason, that physicians, on account of the exposure, hard work and irregular hours incident to their profession, are likely to have a lower death age than that of other, more sheltered occupations. Recently, however, there have appeared several instances in which physicians have attained extreme longevity, which may to some extent counteravail this popular impression.

The late Dr. James Lloyd Wellington, who for several years had been not only the oldest living alumnus of Harvard College and of the Harvard Medical School, but the oldest practising physician in the United States, was ninety-eight years of age at the time of his death on February 11, 1916. The present oldest living graduate of Harvard is Dr. Nicholas Emery Soule, who was born at Exeter, N. H., on June 13, 1825. He was graduated from Phillips Exeter Academy in 1842 and received from Harvard the

degree of A.B. in 1845, and that of A.M. in 1848. He studied medicine at the University of Pennsylvania, from which he received the degree of M.D. in 1851. He settled as a practitioner at Cincinnati, Ohio.

It is even more interesting and remarkable that the next two senior graduates to Dr. Soule are also physicians, Dr. Samuel Franklin Coues of Cambridge, Mass., who was born on September 17, 1825, and Dr. Abner Little Merrill of Boston, born on January 23, 1826. Dr. Coues is the only surviving classmate of Dr. Soule in the class of 1845 and Dr. Merrill is the only survivor of the class of 1846. Dr. Coues received the degree of M.D. from the Jefferson Medical College in 1849, and Dr. Merrill received his in the same year from the Harvard Medical School, of which he is now the senior living alumnus. This remarkable trilogy of venerable physicians is unusual evidence that longevity is not incompatible with the profession of medicine.

MEDICAL NOTES.

HEALTH OF NEW YORK CITY.—According to figures prepared by the Department of Health, the health of the city was considerably better during the past week than during the corresponding week of last year. The decrease in the death rate meant a saving of 309 lives. In other words, had the death rate of the corresponding week of last year prevailed during the past week, 1,983 persons would have died, whereas only 1,674 died during the week. This is equivalent to a rate of 15.63 per thousand of population in contrast to the rate of 18.51 during the corresponding week in 1915.

The death rate for the first fifteen weeks of 1916 was 15.64 as compared with 15.50 for the corresponding period of last year. Considering the very unfavorable climatic conditions prevailing this spring, and the outbreak of grip in January, this is not a bad showing.

MONTCLAIR BOARD OF HEALTH.—The twenty-first annual report of the Board of Health of Montclair, N. J., records a death rate for the town of 9.8 per 1000 inhabitants, which is the lowest with one exception, during the past thirty years. As the chief causes of death, organic diseases of the heart ranks first, with tuberculosis of the lungs and Bright's disease ranking second and third, respectively. Pneumonia follows, with cancer as fifth leading cause. The birth rate for the year was 20.8. The infant mortality rate, 65, was but one point above the lowest on

record, and was 19 points below that of the year 1914. This rate means that only 65 infants died in Montclair per 1000 births, compared with a rate of over 100 deaths per 1000 births in the country at large. There was one case of poliomyelitis during the year.

NEW YORK DEATH RATES.—The Health Department reports that 1624 persons died week before last in New York City, a rate of 15.16 per 1000 of population, as compared with 1750 deaths and a rate of 16.70 for the corresponding week of last year. This difference in the weekly rate is equivalent to a saving of 165 lives. In other words, if the death rate for the corresponding week of last year prevailed during that week, 165 more persons would have died. This saving of life has been effected through the reduction of the number of deaths from the following causes: heart disease, influenza, bronchitis, lobar pneumonia, broncho-pneumonia, pulmonary tuberculosis and other tuberculous diseases. The acute contagious diseases, on the other hand, showed a slight increase over the corresponding week of last year and over the previous week of this year, as did also the number of deaths from nephritis, diseases of the nervous system and violence.

Despite the good health conditions prevailing during the past few weeks, the death rate for the first 13 weeks of 1916 was 15.66, as compared with 15.12 for the first 13 weeks of 1915, the higher figures this year being due to the epidemic of grip in January. In spite of the handicap, however, health officials expect to reduce the city's death rate below that of last year.

SAPONIN BARRED FROM FOOD PRODUCTS.—The addition of saponin to food mixtures, which are sold for use in place of white of eggs, is regarded by the Bureau of Chemistry of the Department of Agriculture as constituting adulteration within the meaning of the Food and Drugs Act. In "Service and Regulatory Announcements No. 17" it is stated that the practice is usually adopted for the purpose of concealing inferiority and that, therefore, it comes within the definition of adulteration in the Food and Drugs Act. Saponin is used extensively in so-called substitutes for white of egg for the purpose of producing foam, and thus giving the articles a fictitious appearance of body and, therefore, of food value.

Saponin is a substance that when dissolved in water foams like soap. It is extracted from plants known as soapbark and soaproot, and a few other plants, by boiling them in water. When saponin is added to the so-called substitutes for white of eggs, it produces a foam similar in appearance to the foam produced by genuine white of egg.

ST. LAWRENCE STATE HOSPITAL.—The twenty-ninth annual report of the St. Lawrence State

Hospital, Ogdensburg, N. Y., records the work of that institution for the year ended September 30, 1915. A total of 2483 insane patients have been under treatment during the year, 435 of this number having been admitted in this time. Of the discharges, 78 were pronounced recovered, 35 as much improved, and 53 as improved. The number of patients paroled during the year was 253. The provisional diagnosis given of the cases admitted is summarized as alcoholic, 6.7%; dementia paralytica, 8.5%; dementia precox, 15.2%; manic-depressive, 17.01%; and senile, 9.79%. In October, 1914, a case of pellagra developed in the hospital, the first case reported in Northern New York. The patient subsequently died.

OPEN-AIR SCHOOLS.—It has been computed that more than two hundred open-air schools and classes for tuberculous and anemic children were in operation at the opening of the last school term. Massachusetts leads the list with 86, 80 of them in Boston; New York has 29 and Ohio 21. The first school of this kind was opened in 1907. The idea seemed to spread slowly, for in 1910 there were but thirteen in use. It is estimated that there should be, in the cities, one open-air school for every 25,000 population.

LOOMIS SANATORIUM.—The Loomis Sanatorium of Liberty, N. Y., for the treatment of tuberculosis, reports that during its past fiscal year it has treated 137 patients. Of this number, 93 were discharged, 31.08% being considered apparently cured, 22.97% quiescent, 9.46% improved, 32.44% unimproved, 4.05% dead.

FOOT AND MOUTH DISEASE.—Report from Washington, D. C., states that on March 31 the United States Secretary of Agriculture issued an order removing all quarantines against foot and mouth disease and all restrictions against the shipment and movement of livestock throughout the United States. This action marks the official conclusion of the extensive epizootic of this disease that has prevailed during the past year.

"The order signed specifically removes the quarantine from a small territory in Christian County, Illinois, the last area which was under suspicion. Along with the removal of this local quarantine, the various federal orders restricting shipment of cattle are rescinded, so that dealers can now ship their cattle as before the first quarantine was imposed. Upon notification that the United States is free from the disease, all foreign governments which have placed embargoes on American cattle are expected to remove these embargoes, so that cattle raisers will be able to resume shipments to these foreign countries.

"As a result of better understanding between the state and national governments, representa-

tives of the department believe that many of the obstacles which confronted the authorities in the past outbreak would not be encountered in dealing with any future occurrence of the disease. The veterinarians, however, will not abate their watchfulness for some time. Examination of animals and animal products offered for import will continue to be unusually strict. The department, moreover, particularly urges all farmers and cattle handlers to notify their state veterinarians and the department of any suspicious cases of sore mouth combined with lameness in their animals.'

PREVALENCE OF MENINGITIS, SMALLPOX, and TYPHOID, FEVER.—The weekly report of the United States Public Health Service for March 24, states that during the month of February, 1916, there were reported in Massachusetts 19 cases of cerebrospinal meningitis and 44 of typhoid fever. During the same period there were in Wisconsin 11 cases of meningitis, 133 of smallpox and 153 of typhoid. In Minnesota there were 47 cases of typhoid and 141 of smallpox.

INFLUENZA EPIDEMICS.—The recent epidemic of influenza has given rise to investigations as to the antiquity of the disease. Some authorities have traced its incipience to 400 or 500 B.C. It has not been difficult, however, to discover pandemics in the Middle Ages, one authority computing about 90, running back to the 12th century, with a well-recognized one in 1510. There seem to be centers in which the infection is preserved, such as remote portions of Asia and Russia, the history of some epidemics pointing to a focus in Northwestern Canada. From time to time the disease breaks loose and spreads both east and west. The epidemic of 1889-90 came to notice in Russia, and in less than a year had spread from Germany to France and throughout Europe, to North America. By March it had reached India and Australia, and by April or May, China and the Gold Coast of West Africa.

PLAGUE PREVENTION BY THE UNITED FRUIT COMPANY.—The eradication of rats for the prevention of plague is of necessity carried on with vigor by the United Fruit Company, in its various tropical stations. The rules of the company, at New Orleans, are that all ships shall be breasted off six feet while discharging and loading cargo. No communication with shore is permitted, except that absolutely necessary for the handling of the cargo. Only the captain and purser are permitted ashore. At Costa Rica, 1799 rats have been trapped and poisoned during the year. All rats caught in the vicinity of the wharf are immersed in kerosene and sent to the laboratory for examination. At Tela, Honduras, the company's houses are built to keep them as free as possible from rats, and

the town proper is but slightly infested with them. On some of the farms, rat pits are dug to catch these animals. These are about three feet deep, with smooth sides, and from six to eight dead rats are caught in them daily.

CONVENTION OF SOCIETIES FOR MENTAL HYGIENE.—The second convention of societies for mental hygiene was held on April 3 and 4, at New Orleans, under the auspices of the National Committee for Mental Hygiene and the Louisiana Society for Mental Hygiene. At the opening session on the afternoon of April 3, there were addresses by Dr. Edward M. Brush, president of the American Medico-Psychological Association; Dr. Frankwood P. Williams, executive secretary of the Massachusetts Society for Mental Hygiene, and others. Dr. Williams considered the question how societies for mental hygiene can best carry out educational publicity. At the evening session on that day there were addresses by Dr. William A. White, on the aims of mental hygiene; by Professor John M. Fletcher, on the relation of mental hygiene to education; and by Dr. Thomas W. Salmon, on the main features of a program for provision for the feeble-minded. At the morning session, on April 4, the societies for mental hygiene in Alabama, California, the District of Columbia, Louisiana, Massachusetts and Rhode Island presented reports on their work during the past year. The evening meeting of that day was held in conjunction with the 72d annual meeting of the American Medico-Psychological Association. Dr. Elmer E. Southard of Boston discussed the place of mental hygiene in preventive medicine, and Dr. William L. Russell of New York considered the function of hospitals for the insane in the advance of mental hygiene.

AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—At the annual meeting of the American Medico-Psychological Association held in New Orleans on April 5, Dr. Charles G. Wagner of Binghamton, N. Y., was elected president for the ensuing year.

PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for March 31 states that during the month of February, 1916, there were reported in Mississippi 4272 cases of malaria, 331 of pellagra and 214 of typhoid fever. During the same period there were reported in Ohio 16 cases of cerebrospinal meningitis, 201 of smallpox and 171 of typhoid. There were 11 cases of poliomyelitis each in Mississippi and Virginia. There were 280 cases of smallpox in Kansas, 85 in Michigan and 63 in California.

EUROPEAN WAR NOTES.

SCOTTISH RED CROSS HOSPITAL SHIP.—It is announced that the Scottish Red Cross Hospital

ship, *St. Margaret of Scotland*, a 2300-ton vessel, originally employed in the West Indian Intercolonial Mail Service, after reconstruction under the superintendence of the admiralty, is now ready and destined for service in Eastern waters. The cost of her remodeling, which was about \$100,000, has been defrayed by the Scottish Red Cross. The *St. Margaret* has accommodation for 92 patients in seven wards, named Clyde, Forth, Tay, Tweed, Dee, Spey, and Doon, after the seven largest rivers of Scotland. There is also room for the accommodation of over 80 emergency cases in hammocks.

WAR RELIEF FUNDS.—On April 15 the totals of the principal New England Relief Funds for the European War reached the following amounts:—

Belgian Fund	\$112,064.67
Allied Fund	77,048.15
French Wounded Fund ..	69,422.64
French Orphanage Fund ..	38,209.09
Surgical Dressings Fund ..	23,062.17
Italian Fund	17,014.31
French Refugees Fund ...	8,526.50
P. S. D. Fund	7,922.73
Cardinal Mercier Fund ..	3,523.00
Brittany Fund	2,287.95

BOSTON AND NEW ENGLAND.

THE CLEAN MILK BILL.—Dr. Charles F. Withington, President of the Massachusetts Medical Society, would be very glad if all doctors of the State would immediately get in touch with their representatives and senators and ask them to vote for the McLaughlin Clean Milk Bill. The Bill gives the State Department of Health the right to pass state milk regulations. These regulations are to be enforced by local boards, but if the local boards fail to enforce them, or upon their request, the State Department of Health will enforce them. A grading system, based on sanitary differences in milk and the conditions of milk production, may be established under the Bill, but it is optional with the local boards whether grading shall be established in their departments or not. The matter of Pasteurization is also left to the local boards. For the protection of producers, no regulations can be effectual unless approved by the Governor and Council after a hearing. A great many interests have approved the bill, including the executive committee of the Grange.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 15, 1916, there were 242 deaths reported, with a rate of 16.59 per 1000 population, as compared with 289 and a rate of 20.13 for the corresponding week of last year. There were 42 deaths under 1 year, as compared with 51 last year, and 82 deaths over 60 years of age against 85 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 68; scarlet fever, 52; measles, 168; whooping cough, 45; typhoid fever, 4; tuberculosis, 69.

Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 6; typhoid fever, 1.

Total deaths from these diseases were: Diphtheria, 5; scarlet fever, 3; whooping cough, 2; tuberculosis, 23.

Included in the above were the following deaths of non-residents: Diphtheria, 2; scarlet fever, 2; tuberculosis, 2.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MARCH, 1916.—Measles, whooping cough, scarlet fever and diphtheria continue to be the prominent factors in the communicable disease reports. All of these diseases show a tendency to decrease, except measles. From past experience with this disease, we can probably expect it to continue to spread during April and May. The total number of cases of communicable diseases reported to this department during March was considerably greater than during February, but about the same as those reported for March of 1915. The comparatively large number of communicable diseases reported are due to the continued spread of measles to new territory.

The distribution of the various communicable diseases shows some interesting facts. Measles has been prevalent for several months in the Northeastern Health District, with the point of intensity at Lynn. Chelsea, Saugus and Winthrop have had a considerable number of cases. In this area the infection seems to be decreasing. In the Eastern Health District there has been a rapid increase of cases since the middle of February. Brockton and Whitman seem to be the center of this focus of infection. With the exception of Worcester and Springfield, epidemic measles is confined to the above-named health districts.

Whooping cough is not decreasing in amount. Study of the records shows that it has been present with little variation since January, 1915. It is well distributed all over the state. In the following cities and towns it is above the average for that city or town: Bourne, Middleborough, Rehoboth, Brookline, Cambridge, Andover and Springfield.

Scarlet fever is decreasing. This is true in comparison with February and also in comparison with March, 1915. However, in the following cities and towns it is still prevalent in unusual amounts: Braintree, Brookline, Norwood, Quincy, Chelsea, Lynn, Needham, Warren and Montague.

Diphtheria is still well distributed over the state. It is decreasing in amount. It remains an important factor in the returns from the following cities and towns: Attleborough, Cambridge, Norwood, Malden, Newbury, Lawrence,

Woburn and Pittsfield. It is to be noted that in a number of places the reports for diphtheria include "carriers" discovered in the course of routine school examinations.

As usual, tuberculosis heads the list as the causes of death, with 277 deaths during March.

Diphtheria caused 42 deaths during last month. This is a considerable decrease over the same disease for the month of February. The fatality rate was 6.2. This is unusually low.

Whooping cough continues to take an unusual number of lives. With 927 reported cases there were 21 deaths. This gives a fatality rate of 2.3, and does not account for the complications and sequelae.

Measles accounted for 16 deaths during March. These are only those deaths actually reported as being caused by measles. A study of the death certificates reveals the fact that a great number of deaths reported as being caused by pneumonia are really caused by measles. Notwithstanding the monthly record of deaths caused by measles, directly or indirectly, people continue to consider it a "harmless" disease.

Scarlet fever caused 9 deaths last month. The fatality rate was 1.1. Considering the fatality rate for the same month last year, this disease was only one-half as fatal.

Typhoid fever continues to show a gratifying decrease in amount. While it caused a total of only 8 deaths during March, the fatality rate was unusually high—16.0. This unusually high fatality rate may be due to a failure in reporting cases.

The only epidemic of note is the one now in progress at Brockton and Whitman. In this case it is measles. Brockton authorities are making earnest efforts to control the infection.

There have been 3 cases of trichinosis reported during March in the following cities: Springfield, Chelsea and Haverhill. Pellagra has been reported from the following places: Danvers, Newton, Northampton and Boston.

There has been a sharp outbreak of anthrax, principally in Winchester and Woburn, with isolated cases at Chelsea and Somerville. An investigation of this outbreak is in progress and a complete report will be published later.

NEW CONVALESCENT HOME AT NEWPORT, R. I.

—On June 1 there will be opened at Newport a home for woman convalescents, of a type for which there seems to be a distinct need. It is primarily to afford an opportunity for recuperation, under nursing by graduates, to patients of only moderate means, for whom there is at present practically no adequate provision. As it is the purpose of the founder merely to keep the institution self-supporting, the charges will be correspondingly low. At first there will be available some fifteen beds. It is hoped that this modest undertaking will prove a great success.

DENTAL REGISTRATION IN MASSACHUSETTS.—It is announced that of 128 applicants who took the recent examination for dental registration in this state, only 34 were passed, among whom were three women candidates.

SOCIAL SERVICE IN HOSPITALS.—In last week's issue of the JOURNAL we noted the meeting held on April 6 in the interest of the social service department at the Boston City Hospital. The principal addresses at this meeting were made by Dr. Alexander Lambert, director of social service at the Bellevue Hospital, New York; by Miss Gertrude Farmer, who occupies a similar position at the Boston City Hospital; and by Dr. George G. Sears, president of the City Hospital Senior Staff. Dr. Lambert referred particularly to the value of social service in securing better results from treatment in cardiac cases following the discharge of the latter from hospitals.

"In the children's department the work has been particularly effective. All children born at Bellevue are followed up for a full year after their mothers are discharged. They get a good start in life. Their mothers are instructed in the proper care of infants, particularly in regard to the right kind of food. Also every child now coming to Bellevue for treatment gets an opportunity to live in the country during convalescence. One of the important effects the department has, I think, is the prevention of destitution among the families of bread winners confined to the hospital through sickness."

MASSACHUSETTS SCHOOL FOR THE FEEBLE-MINDED.—The sixty-eighth annual report of the Trustees of the Massachusetts School for the Feeble-Minded, at Waltham, states that for the year ended November 30, 1915, the population of the institution was 1740 inmates. This includes the colony at Templeton. There were 228 admissions, of whom 75 were under fourteen years of age, and capable of being taught to read and write; 15 were under fourteen years of age, and were improvable, but not capable of being taught to read and write; 59 were males over fourteen years of age; 44 were females over fourteen years of age; 7 were cases of spastic paralysis; 7 were epileptic; 9 were of the Mongolian type of idiocy; and 2 were cases of sporadic cretinism. Three cases of pellagra have been recognized among the patients. The out-patient work of the school has greatly increased. A clinic is held at the school at Waverley every Thursday. Monthly clinics are held in connection with the school authorities in Fall River, Worcester and Haverhill, and it is planned to open others at Framingham, Waltham and New Bedford.

METROPOLITAN DISTRICT DENTAL SOCIETY.—The fifty-first annual meeting of the Metropolitan District Society of the Massachusetts Dental Association was held in Boston on April 3

with about seventy members in attendance. The principal address was delivered by Dr. Frank A. Delabarre on "Orthodontia." Dr. Roy C. Skinner was elected secretary and Dr. Waldo E. Boardman treasurer for the ensuing year.

CUTTER LECTURE.—The annual Cutter Lecture, on "Preventive Medicine and Hygiene," was delivered at the Harvard Medical School on Monday, April 3, by Dr. George W. McCoy, director of the Hygienic Laboratory of the United States Public Health Service. This lecture is given under the terms of a bequest from John Clarence Cutter. Dr. McCoy, formerly superintendent of the leper colony on the Island of Molokai, Hawaii, selected as his topic, "The Public Health Aspects of Leprosy." He pointed out that the laws compelling the isolation of persons suffering from non-contagious types of leprosy are founded on fallacy and superstition, and that such persons should be exempted from isolation. Of the vaccine treatment of the disease, he said that, owing to the great chronicity of untreated leprosy, many years must elapse before definite results from vaccine treatment can be determined. It is hoped that this lecture may later be published in full in the JOURNAL.

INVESTIGATION OF NON-PULMONARY TUBERCULOSIS.—There is at present pending before the Massachusetts General Court, a resolve introduced by Dr. Richard C. Cabot, providing for an investigation, by the State Department of Health, of non-pulmonary tuberculosis, which is believed to be on the increase in the community. At a recent hearing on this resolve before the house committee on ways and means, Chairman Hart of the committee of public health, advocated the segregation of non-pulmonary, as of pulmonary, tuberculosis, for the safeguarding of the community.

HOSPITAL BEQUESTS.—The will of the late Richard N. Sturtevant of Somerville, Mass., who died on March 28, contains a bequest of \$1000 to the Somerville Hospital.

The will of the late Mary Forbes Russell of Milton, Mass., which was filed for probate on April 7 at Dedham, contains bequests of \$5000 each to the Harvard Dental School and the Milton Convalescent Home.

NORFOLK STATE HOSPITAL.—The second annual report of the Trustees of the Norfolk State Hospital was issued on April 7.

"The trustees report that building and appurtenances, which will cost \$93,500, are nearing completion, but that a further appropriation of \$54,500 for construction is necessary in the near future.

"The institution was originally planned to be a hospital unit with 500 beds. When the present buildings are occupied there will be 400 beds.

With an average of 232.66 patients during the year, the weekly per capita cost was \$10.88. The trustees estimate that with an average of 350 patients during the coming year the weekly per capita cost will not exceed \$7.25. If the hospital unit could be completed along the lines it was originally planned, the trustees believe the weekly cost per patient would decrease to \$5.95.

"The trustees urge that a dormitory to accommodate 100 confirmed inebriates be built.

"The report of the superintendent shows that a total of 4051 patients have been treated since April, 1909, by the Norfolk Hospital, and its predecessor, the Foxboro Hospital. Of those, 153 have died, 49 are insane, and 1738 have moved from their last recorded address.

"Of the remaining 2111, 944 are abstinent, 235 are improved, drinking some, but earning their living, and 932 are unimproved and not permanently benefited.

"The trustees again recommend an appropriation for a building for women patients."

BOSTON HOSPITAL UNITS.—In conjunction with the work of preparation recently undertaken by the United States War Department, by way of organizing the civil hospitals of the country in such a way as to make them available for military purposes in the event of war, three hospital units have been established in Boston, one at the Massachusetts General Hospital under the command of Dr. Frederick A. Washburn, one at the Boston City Hospital, and one at the Harvard Medical School. Each of these units is to be prepared to handle five hundred patients, and its staff of two hundred will include surgeons, physicians, dentists, nurses, orderlies and cooks. All members of a unit pledge themselves to answer a call to service within two years, to go to any point in this country or on foreign soil at the command of the war department. The unit at the Harvard Medical School is under command of Dr. Harvey Cushing. Dr. Washburn is in chief command of the Massachusetts General Hospital unit, with Dr. Richard C. Cabot as director of the medical section, Dr. George W. W. Brewster of the surgical section, and Dr. J. Homer Wright of the laboratory section.

Under Dr. Cabot are Drs. George S. C. Badger, A. Watson Sellards, George Clymer (neurologist), Paul D. White, James H. Means and Wade S. Wright. Under Dr. Brewster are Drs. Lincoln Davis, Z. B. Adams (orthopedist), Beth Vincent, William J. Mixter, Ralph A. Hatch (oculist), Elliott C. Cutler, Arthur W. Allen, George A. Leland, Jr., and L. M. S. Miner (dentist). Under Dr. Wright are Drs. Roger Kinnicutt (bacteriologist) and Walter J. Dodd (roentgenologist).

Miss Sara E. Parsons, superintendent of nurses of the Massachusetts General Hospital, will be chief nurse; and Miss Mary E. Reed, dietitian of the McLean Hospital, will be dietitian.

MONSON STATE HOSPITAL.—It is announced that, under the auspices of the trustees and with the approval of the State Board of Insanity, the Monson State Hospital, at Palmer, Mass., is planning to hold, on May 4, a review of the twenty years' work of that institution. To this review each member of the staff will contribute papers, which will be read by title. The clinical and laboratory work in progress will be reviewed and an effort made to gather all who have contributed largely to the success of the hospital. There will be a morning meeting devoted to general considerations and an afternoon meeting devoted to medical papers. Invitations have been extended to members of the Association for the Study of Epilepsy and Feeble-Mindedness, of the Boston Society of Psychiatry and Neurology, of the New England Society of Psychiatry, and to trustees of state institutions, including past and present trustees of the Monson Hospital.

The forenoon session will be devoted to matters of general consideration, inspection of departments of the hospital work, exhibits, demonstrations, illustrating some of the papers read by title, and preparations for the afternoon meeting, including a summary of researches in epilepsy, with special reference to Monson State Hospital.

Other papers will be presented by Dr. Stedman on the founding of the Monson State Hospital; by Dr. Owen Copp, on the history of its administration, and by Dr. C. W. Page, on the medical value of optimism. The papers presented and read by title at this meeting will be published later, in a group, to commemorate the occasion.

Miscellany.

MEMORIAL RESOLUTIONS.

THE following memorial to Dr. Silas A. Houghton was read at the last meeting of the Obstetrical Society of Boston, held March 28, 1916, and it was unanimously voted that the memorial be spread upon the records and a copy sent to the BOSTON MEDICAL AND SURGICAL JOURNAL.

ROBERT L. DENORMANDIE,
Secretary.

SILAS A. HOUGHTON.

Impartial Death has once again chosen a shining mark; passing by fullness of years and gray hairs, and beckoning to one at the very acme of mental and physical powers, who still, in his heart, rejoiced in his youth.

Silas Houghton was a man of singular sweetness of character, delicacy of thought and method, modesty and gentleness. His habit of mind and body was of unusual temperance; his nature characterized by much tenderness and deep af-

fection. He did not manifest the aggressiveness of the fighter, but rather the unvarying courtesy which we like to associate with the chivalry of the Middle Ages. He apparently never made an enemy; a man is yet to be found who has heard another speak slightly or disparagingly of Dr. Houghton. Everyone regarded him as his best friend. In spite of this unusual combination of characteristics, there was never a trace in him of weakness, nor lack of determination or of latent power.

Dr. Houghton was a man, and a man's man as well. Professionally, he was an example to prove that the day of the good general practitioner is happily not yet past. In the age of unbridled specialism, Dr. Houghton maintained the tradition of the family practitioner of the old days, with the added essential of familiarity with all the best results of recent medical progress. He not only knew when to call a specialist to his aid, but equally well which particular specialist to call to the particular individual.

To his patients he was literally "the beloved physician"; to his associates, one whose judgment invariably commanded consideration and respect; to his friends, both professional and the lay, he represented the purest ideals of manhood and comradeship.

In his unexpected and all too early death, the Obstetrical Society suffers an unusual loss, which it hereby registers.

To his widow and children the Obstetrical Society offers an expression of the keenest appreciation and the deepest sympathy.

"Scarce had he need to cast his pride or slough the dress of earth.

E'en as he trod that day to God, so walked he from his birth.—

In simpleness and gentleness and honor and clean mirth!"

Correspondence.

AN AMERICAN AT ST. BARTHOLOMEW'S HOSPITAL.

(From Our Special Correspondent.)

OXFORD, ENGLAND, February 28, 1916.

Mr. Editor: To an American St. Bartholomew's Hospital presents a strange spectacle. At first he is aware of the modern efficiency of the great institution as a hospital, dispensary and medical school. This, however, may be found in other hospitals than St. Bartholomew's and other places than London. It is the shadow of the past which makes it unique among the hospitals of today. For eight centuries St. Bartholomew's has been serving the people of London and its development is bound up with their changing fortunes.

It was founded in the year 1123 by a priest, Rahere by name, in accordance with a vow made by him, previously, at Rome where he had been told in a dream to get him to London and there found a hospital at Smithfield. He obtained a grant of the land, upon which the hospital still stands, from Henry I, and incorporated the hospital with a priory. This relation continued until the suppression of the monasteries

when the hospital, with its revenues, came into the possession of Henry VIII. In 1547 this monarch granted it a fresh charter and gave back most of its revenue with these words: "Considering the miserable estate of the poore, aged, sick, low, and impotent people, as well men as women, lying and going about begging in the common streets of the said City of London and suburbs of the same, to the great paine and sorrowe of the same poore, aged, sick and impotent people, and to the great infection, hurt and annoyance of His Grace's loving subjects, which must of necessity goe and pass by the same poore, sick, low and impotent people, being infected with divers great and horrible sicknesses and diseases." The patients of this hospital must have looked out upon many strange sights in Smithfield Market. Here some hundreds of Protestants were burned at the stake by the order of Queen Mary, and later a similar fate befell non-conformists during the reign of Elizabeth. Here also William Wallace was beheaded and, according to tradition, Wat Tyler was struck down by the Lord Mayor of London. On the hospital staff have served such men as Harvey, the discoverer of the circulation of the blood, who, in 1609, was appointed physician to the hospital and retained this position over a period of 34 years.

Records show that at the time of granting its second charter by Henry VIII, there were 100 beds in the hospital. More than seven times that number are now provided and a convalescent home has been established at Swanley. In addition to this, St. Bartholomew's founded, several years ago in South London, a base hospital, to be used for wounded soldiers in case of war. There are at present 500 beds in this extension and preparations are rapidly being completed to accommodate another 500. One staff of doctors and laboratory men does the work in both places. One wing of the hospital itself, containing 270 beds has been turned over to wounded soldiers, each ward numbering 24 beds. Here I noticed a cross bar suspended by a strap over each bed so that, as in the military hospital trains, the patients may lift and move themselves more easily. The demand for nurses in the military hospitals is, at present, so great that probationers are admitted to training courses of shorter duration instead of the usual three years.

Within the last eight years several new buildings have been added to the group at a cost of over a million dollars. Of these buildings the out-patient department is especially well equipped and, until recently, 1000 cases, on an average, were treated here daily. This number has been reduced to about 700, because of the operation of the recent Insurance act which assigns each insured man to a doctor. Unless the case is especially serious, these doctors attend the patients thus assigned to them, and in this way the out-patient departments of London hospitals have been relieved of many cases.

Among other things, St. Bartholomew's contains a very fine library, with reading rooms for students and doctors; also a museum, boasting the largest collection of pathological specimens in the United Kingdom. Recently, however, a large proportion of this collection has been stored away, probably below ground, to be safe from the bombs of hostile aircraft.

There were, at one time included within the walls of the hospital, four chapels. Of these, one, very quaint and ancient, remains, and here services are held regularly. Indeed the hospital is in itself a parish, a division of considerable importance here in England.

Although every ward and vacant room is filled with sick and wounded, the number of students is sadly depleted. In the anatomy room one sees a lonely group or two of students, while the lecture rooms are almost empty. In times of peace the Medical School numbers 400 students, being incorporated in the University of London, which grants degrees to the students. Arrangements are also made, however, for men taking Oxford or Cambridge degrees to receive

their clinical instruction here. A certain number of men are being continually sent back from the front and the navy to complete their medical courses. They are advanced students, but are not numerous enough to make up for those recently called out under the Derby scheme.

Sincerely yours,
W. G. P.

CAESAREAN SECTION: A REJOINDER.

BOSTON, MASS., March 31, 1916.

Mr. Editor: Dr. Kellogg in his article published in the JOURNAL of March 30 has, I think, given an erroneous impression in several points.

First: He has taken the position that operative labor has no maternal mortality. This is incorrect, as is shown in my paper in the same number of the JOURNAL. There is a tendency to compare unconsciously the results of Caesarean with those of normal labor, but in those cases where the alternatives are high-operative delivery or Caesarean section, there can be little doubt that the latter will give far better results for both mother and child.

Second: In regard to primiparous breech presentation, a breech presentation, as I have shown (*Interstate Med. Jour.*, 1915, xxii, 384), usually means lack of accommodation between fetus and pelvic inlet or uterine cavity. Unless this disproportion is that of relatively small size of fetus, delivery by the natural passages is attended by great risk for the child. In other words, one should try to determine in advance of labor which of the primiparous breech cases are going to fall within the 10% in which the baby is likely to be lost and perform Caesarean section.

Third: In regard to one Caesarean necessitating future deliveries by the same method because of the danger of rupture of the scar, Mason and the writer have shown (*BOSTON MED. AND SURG. JOUR.*, 1910, clxii, 65), by experimental work in animals, that a properly sutured scar, which has healed without infection, is not a weak point in the uterine wall, and I have recently reported (*Amer. Jour. Obst.*, March, 1916) two cases delivered by the natural passages after a previous Caesarean without untoward effects. In one of these I did both the Caesarean and the intrapelvic delivery myself, and the convalescence from the Caesarean was infinitely easier than that from the high forceps delivery which followed.

Fourth: Dr. Kellogg gives the impression that patients, upon whom Caesarean section has been performed, frequently suffer from after-effects. This is certainly rare, whereas a very large proportion of women, who have had hard intrapelvic deliveries, complain of lacerations and loss of support for the relief of which many have to undergo operation.

Fifth: Pubiotomy, as is almost generally admitted, is contra-indicated in infected cases, and therefore should not be performed upon neglected patients.

Finally: Dr. Kellogg has said nothing about the birth paralysis and cerebral injury which sometimes follow hard operative deliveries with intracranial hemorrhage in which the baby succeeds in living, a burden to itself, its parents, and the community. A dead baby is buried, but these live, a reproach to obstetrics.

I agree with Dr. Kellogg in condemning the reckless performance of Caesarean section without proper study of the individual case, but I cannot subscribe to his sweeping denunciation of the operation for suitable indications.

Very truly yours,

JOHN T. WILLIAMS, M.D.

UNITED STATES CIVIL-SERVICE EXAMINATION.

CHIEF STATISTICIAN FOR VITAL STATISTICS (MALE),
\$3000. APRIL 25, 1916.

The United States Civil Service Commission announces an open competitive examination for Chief Statistician for Vital Statistics, for men only. From the register of eligibles resulting from this examination certification will be made to fill a vacancy in this position in the Bureau of the Census, Department of Commerce, Washington, D. C., at a salary of \$3000 a year, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The Chief Statistician for Vital Statistics is the administrative and statistical head and has full charge of the work of the Division of Vital Statistics. He supervises the collection of transcripts of certificates of births and deaths, the tabulation and compilation of the statistical items on these transcripts, and the outlining and presenting of these statistics in the form of annual reports; he aids in securing enactment of efficient laws for the registration of births and deaths, both by correspondence and, if necessary, by appearing before state legislatures and committees thereof; he supervises the investigation of the completeness of the registration of deaths in cities and states which are not now in this registration area but which have requested admission thereto, and makes such recommendations to the Director of the Census in regard to their admission as the results of the investigations justify; he is expected to attend the meetings and conventions of medical and statistical bodies, such as the American Medical Association, the American Public Health Association, and the American Statistical Association.

Graduation from a recognized medical school and at least four years' experience in charge of the vital statistics of a city or a state or in a position of similar importance requiring expert knowledge of vital statistics are prerequisites for consideration for this position.

Statements as to education, experience, and fitness are accepted subject to verification.

Applicants must have reached their thirtieth but not their fiftieth birthday on the date of the examination.

Under an act of Congress applicants for this position must have been actually domiciled in the state or territory in which they reside for at least one year previous to the date of the examination.

This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Form 1312, stating the title of the examination for which the form is desired, to the United States Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Post Office, Boston, Mass.; Philadelphia, Pa.; Atlanta, Ga.; Cincinnati, Ohio; Chicago, Ill.; St. Paul, Minn.; Seattle, Wash.; San Francisco, Cal.; Cushmanhouse, New York, N. Y.; New Orleans, La.; Honolulu, Hawaii; Old Cushmanhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed, excluding the medical certificate, but including the county officer's certificate to which a 10-cent internal-revenue stamp must be attached, and filed with the Commission at Washington prior to the hour of closing business on April 25, 1916. Those meeting the preliminary requirements, as shown in connection with their applications, will be furnished with a special form and material, which must be submitted to the Commission

prior to the hour of closing business on May 16, 1916. The exact title of the examination as given at the head of this announcement should be stated in the application form.

NOTICE.

THE CUTLER LECTURE on preventive medicine and hygiene, by Simon Flexner, M.D., Director, Rockefeller Institute for Medical Research, on "The Finer Adjustments of the Immunity Reactions to Recovery from Infection," will be given Wednesday, April 26, 1916, at the Harvard Medical School, from 5 to 6 P.M.

SOCIETY NOTICES.

NEW ENGLAND SOCIETY OF DERMATOLOGY AND SYPHILIS.—The next meeting of the Society will be held at the Boston City Hospital on Tuesday, April 25, at 3.30 P.M., in the Surgical Out-Patient Building. The medical public is cordially invited to attend.

CHARLES J. WHITE, M.D., *Secretary.*

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the Peter Bent Brigham Hospital, on Tuesday evening, April 25, at 8.15 o'clock.

PROGRAM.

1. Exhibition of cases.
2. The Value of the Roentgen-Ray in the Diagnosis and Better Understanding of Pulmonary Tuberculosis. Dr. Fred H. Heise and Mr. Homer L. Sampson of the Adirondack Cottage Sanitarium, Saranac Lake, N. Y. Discussion by Dr. E. A. Locke, Dr. V. Y. Bowditch, Dr. Gladys L. Carr and Dr. Walter J. Dodd.

Medical students and physicians are cordially invited. Telephone Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the Hospital.

There will be a special medical meeting in the amphitheatre of the Peter Bent Brigham Hospital, on Wednesday evening, April 26, at 8.15 o'clock.

PROGRAM.

Achievements and Opportunities of Medical Work in The Near and Far East.

SPEAKERS:

Dr. Charles W. Elliott, President-emeritus of Harvard University.

Dr. Francis W. Peabody, of the Peter Bent Brigham Hospital, and member of the China Medical Board of the Rockefeller Foundation.

Dr. Ardian S. Taylor, of Yangchow, China.

Dr. Harvey Howard, of Canton China.

Dr. Alden R. Hoover, of Pala, Turkey.

Medical students and physicians are cordially invited. Telephone Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the Hospital.

APPOINTMENTS.

Dr. Frank Billings, of Chicago, has been appointed visiting lecturer on medicine at Harvard University. Dr. Stanley H. Osborn has been appointed district health officer by the Massachusetts State Department of Health.

The board of health of Tuscaloosa, Ala., has appointed A. F. Allen as assistant health officer. Since his graduation from Harvard-Technology School for Health Officers, Mr. Allen has been connected with the health work of Waltham, Mass., and with the epidemiological work in Fitchburg, Mass.

Alfred W. Bosworth, S.B., associate chemist at the New York Agricultural Experiment Station, has been appointed biological chemist for the Boston Floating Hospital.

The Boston Medical and Surgical Journal

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Therapeutic and Preventive Medicine.

CHRONIC BACKACHE.

By HERMAN W. MARSHALL, M.D., BOSTON.

MEN, women and children in all classes of society suffer from chronic backache, and this subject possesses wide interest because of its frequency, its many underlying causes, and from the fact that crippling disability at times results from it. Further discussions and critical studies of data at hand are needed still to settle satisfactorily conflicting views, and there should be no expectation that many confusing, and often apparently contradictory, clinical observations will spontaneously harmonize themselves without prolonged puzzling over their exact significance. The writer accordingly presents his ideas by means of a few typical cases selected to review different types of back troubles, and these will serve to introduce discussions of treatments and other matters of practical importance.

I. *Static Back Strain.* The first case is that of a woman of thirty-six years. The appearance of the back is shown in figs. 1 and 2, exhibiting a slight scoliosis and very pronounced antero-posterior lumbar curve of the spine. The symptoms of which she complained were weakness and dull ache in the lower part of the back, a similar dull ache and feeling of heaviness between the shoulders, and painful symptoms in calves of both legs. There was a personal history of lumbar symptoms intermittently for many years, with no traumata or associated in-

fections. She said pains extended at times to gluteal regions and thighs. Constipation had been a prominent peculiarity during years past, sometimes a week intervening between movements of the bowels. Menstruation was usually regular, there had been no pelvic trouble, no children or miscarriages. Her life had been a varied one with no important occupational elements entering into underlying causes.

Examination of the back showed slight scoliosis, as shown in the photograph, and this peculiarity had not changed appreciably for years. Back motions were free in all directions and of average range, although toward their limits the slight strains complained of were somewhat increased. There was no spasm of muscles of the back and no areas of tenderness on pressure over sciatic nerves, sacro-iliac joints, or other regions.

Social considerations demanded relief at a minimum amount of expense. A spinal-abdominal support, figured in 4, was made immediately and considerably relieved lumbar symptoms as soon as it was put on. Figure 3 shows the patient with corsets, which she had worn previously, readjusted over the orthopedic support to the somewhat changed figure. Appropriate tonic-eliminative drugs and foot strap-pings also were prescribed immediately. These combined to give so much relief to all parts, and so soon, that the patient did not care to spend extra money for x-rays of spine or gastro-enteric tract, or for any further clinical examinations.

What diagnosis should be made in this case? Excessive hollowness of the lumbar spine with some lateral curvature is perfectly obvious, and



Figs.

1

2

3

4

orthopedists might place the case in the group of static or postural back strains. If x-rays had been taken which revealed unusual peculiarities of the lumbo-sacral spine, as often happens, they also might speak of the condition as due to bony spinal variations and consider that the latter primarily increased antero-posterior and lateral curvatures. An enthusiastic medical internist might emphasize the etiological importance of the pendulous abdomen, attributing relief afforded primarily to improved functions of abdominal digestive organs, with indirect secondary improvement in all parts, including the back. Or an internist with strong appreciation of pharmacology might insist that drugs prescribed acted as turning points in restoration of health, affecting in well-recognized ways digestive organs, kidneys and nervous system; that by stimulating these organs into greater healthy activity the drugs permitted orthopedic appliances then to act successfully enough to restore healthy balance. A serologist might direct attention mainly to the condition of the blood and its effect upon tone of back muscles and ligaments, relegating other features to the background as being of secondary importance. Or, if specific reactions of the blood were obtained, the trouble might be classified then as a specific one, postural elements sinking into obscurity although they still continued to exist unchanged. Social workers presumably would delve into personal habits, home, and work of the individual in an endeavor to disclose peculiarities striking enough to classify the case as an occupational trouble.

All these various view-points undoubtedly should be taken into consideration in the one problem, relating as they do to its different aspects; and they demonstrate in an interesting manner how far special knowledge has ramified. No explanations should be needed why enthusiastic acceptance of any single view alone to exclusion of all others is unjustifiable and productive of many unnecessary delays and failures in treatment.

Objections may be raised to management of this case on the ground that treatment was instituted on a "snap diagnosis." In defense it

may be said that all clinical tests cannot be made simultaneously, nor is it necessary to inflict upon all patients complete expensive scientific verifications of natures of their diseases when they are quickly relieved. In this instance the hollow back, prominent abdomen, absence of limitation of back motions, and lack of tenderness to pressure in the back, together with distribution of painful symptoms in three widely different localities suggested immediately an obscure, slightly debilitated state, with relaxed muscles and strained ligaments of these different parts. The most promising remedies were tried first, but other procedures were arranged to follow if necessary; and simply in this instance the first attempt happened to be successful.

II. *Low Back Strain Associated with Injury.*

A man of sixty years was lifting down a heavy barrel of fish from an elevated position and felt something snap low down in his back. He had had no serious trouble previously but immediately following this accident severe back pain was noticed, and for twenty months the symptoms have persisted in variable degree. Figures 5, 6, 7, 8 show the patient's appearance. Examination revealed limitations of back motions, localized tenderness over both sacro-iliac regions which was much worse on the left side, with decided spasm and soreness in the lumbar muscles. The hips apparently were not involved. Figures 7 and 8 show the patient's attempts at forward and backward bending twenty months after his injury. X-rays demonstrated no marked variations in lumbar vertebrae or sacrum. No displacements of bones or relaxations of ligaments could be made out on examination.

The patient gave a definite history of chronic constipation, but had had no genito-urinary trouble nor recent infections. Interpretation, when the patient was first seen fourteen months after the injury, was that the condition represented a low back strain probably accompanied by an imperceptible slipping of the left sacro-iliac joint. It seems probable that primarily there had been a mild debilitated condition of gastro-enteric origin from chronic constipation, and that this resulted in a slight lowering of tone of back muscles and lessening of resistance



FIGS.

of ligaments. Presumably in moving the heavy weight an unusual strain happened to be thrown upon the slightly relaxed muscles and weakened ligaments of the left sacro-iliac joint so that it gave way very slightly. The opposite sacro-iliac joint and neighboring lumbar muscles became unusually strained, too, on account of underlying vascular conditions, and also because of extra work put upon them to favor the joint first affected.

The patient succeeded in working after his injury for several months with difficulty, then was laid off for a few weeks, but continued to have trouble when he returned again. When first seen by the writer a spinal-abdominal support, similar to the one figured in 4, was prescribed immediately. This very gradually relieved the pain, and when the patient was seen again, six months after, it was being worn too loosely to afford much support. This fact probably accounts for the slow progress made at this time, as back strappings tightly applied promptly relieved the chronic symptoms. The abdominal belt, however, had helped restore functional activities in abdominal viscera, similarly as in the first case, and the patient commented on the great comfort of the support as soon as it was put on. Discussion of slipping of the bones will be undertaken later.

III. The third patient is a little girl of thirteen years, who came for treatment of back deformity more than on account of painful symptoms. She noticed her shoulders were getting round, one becoming higher than the other, and that her posture was growing bad. Figures 9 and 10 indicate her appearance, and she will be readily recognized by everyone as a very common type, a rapidly growing, slightly anæmic, adolescent patient, with relaxed muscles and delicate health. Tonic drugs, regulations of digestive functions and personal hygiene, combinations of rest, local support and gymnastic exercises for back muscles are ob-

viously indicated for this girl for a considerable period until she has attained her growth.

It is easy to see how the scapulae of this patient may become harmfully bent and be permanently flexed when they are completely hardened. She naturally introduces the fourth case, a woman with flexed scapulae and strain of sacro-iliac joints.



FIGS.

9

10

IV. A woman of twenty-eight years, a governess, sought relief for dull aching pains referred to the entire back but which did not extend into the legs. She had suffered with these symptoms for about five years and they had come on gradually. She was a relaxed person of neurotic temperament. She had had an abdominal operation performed several years previously, an appendectomy and ovariectomy, and was still troubled with constipation. She had tonsillitis regularly every winter. A plaster jacket relieved symptoms low in the back, but pains in region of the shoulders and neck persisted. The scapulae were operated on and found moderately incurved. She still considered the scapula

operation a benefit eight years afterwards, because it had relieved the aching neck and shoulders, although there was some restriction then in extreme limits of arm raising. An x-ray taken eight years after the first supportive treatments were begun, is shown in Fig. 37 and indicates the absence of appreciable anatomic peculiarities of the lumbo-sacral spine. Details of symptoms low in the back are as follows: Pains were considerably relieved, promptly, by a plaster jacket which was put on with the patient recumbent on a Goldthwait frame. Lumbar pains slowly subsided still more during the period after operation when a spring steel back brace with pelvic band was worn for a year afterwards. Then for four years the patient remained comfortable, increased in weight and strength and was married. A recurrence of sacro-iliac strain occurred five years after the plaster jacket had relieved her symptoms, but new corsets with pelvic band of webbing were fitted, and these supported her fairly well for the next two years. Eight years after the jacket was first applied, lumbar pains again returned, this time extending into both thighs. A short spring steel back support was adjusted under the corsets and it relieved the symptoms a little, but she still possesses a weak back and probably will continue to strain it easily as long as she possesses an unstable neurotic temperament with frequent slight digestive and pelvic irregularities. She notices now that after bending forward to lace her shoes, several hours of dull aching sensations in the back follow, and she also always selects chairs to sit in which have straight backs, for these do not strain so much the ligaments of the lumbo-sacral region.

V. *Postural Shoulder Strain.* A Greek fruit dealer, aged twenty-eight years, complained of dull pains in back, shoulders and arms. Duration of symptoms two years. Occasionally he had pains also in the left hip. The most striking feature in this case is the rounded posterior curve of the dorsal spine, which suggests an old healed tubercular lesion of the spine, but x-rays show no evidence of tuberculosis. The patient

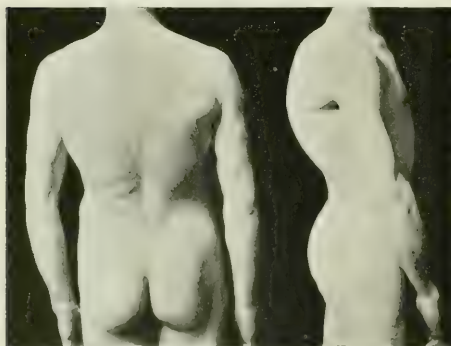
is a small man of sallow appearance. He received no injury, did no heavy lifting, and his shoulder symptoms were variable from time to time. There was no sensitiveness at angles of scapulae, and a routine examination by a medical internist revealed no other abnormalities, so the diagnosis of the shoulder strain has been made, a condition similar to foot strain or low back strains, brought on by vascular defects that, in turn, have been due to poor personal hygiene and to general lack of healthy vitality for a long time.

Medicinal tonics and eliminants together with shoulder strappings were sufficient to relieve his symptoms, but the spinal deformity should be considered an additional factor which helps to strain back muscles and those of the shoulders more than usual; yet entire responsibility for the symptoms should not be attached to this attitude. Figures 11 and 12 show the back and lateral views of the patient in a standing posture.

VI. *Sacro-iliac Strain with Permanent Lateral and Forward List of the Body.* A man of thirty-four, a house painter by occupation, began to have pain in his right leg eight months before photographs shown in Figs. 13, 14, 15, 16 were taken. There was no injury associated with the onset of his trouble. He gradually grew worse, and four months after its beginning there was definite slight lateral curvature of the spine. He stood with the lumbar spine held rigid and with its antero-posterior curve flattened. He was unable to stand erect. There was decided tenderness about the right sacro-iliac joint, and muscles of the right thigh were spastic. Straight leg raising was limited to 30° on the right side, and to 80° on the left side.

Tight strappings over the sacro-iliac region greatly lessened the pain in the legs, and a belt was made for the patient which is figured in 16. This treatment enabled him to work, and he has continued to do so in spite of the listed condition shown in the pictures. At the end of eight months pains were increasing in the right buttock and right calf, but there were no localized points of tenderness over the sacro-iliac region nor over the sciatic nerve. He stood and worked in the slightly stooping posture shown. Hyperextension of the thigh was very painful. His appetite was good, the bowels moved regularly, and he was then gaining a little in weight. His belt had been worn too loosely to afford much support, and strappings, shown in Fig. 15, which reinforced gluteal muscles, immediately made the hip feel better. Tonic-eliminative drugs were prescribed also at this time and these combined measures greatly relieved him.

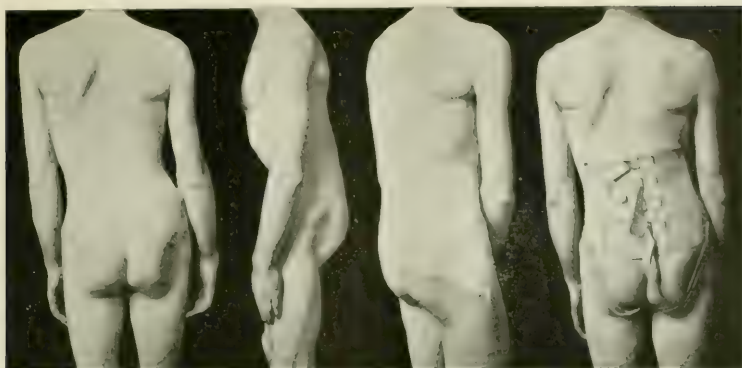
VII. *Fractures of Vertebrae.* A man of forty-nine years, a cement mason, fell from a considerable height one year before he came to the Massachusetts General Hospital for examination. He had been treated with plaster jackets in another institution, but no fracture of the spine had been determined. Additional x-rays



FIGS.

11

12



Figs.

13

14

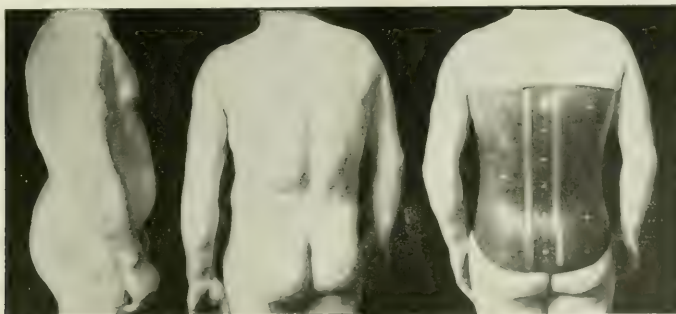
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16

taken at the Massachusetts General Hospital revealed no bony lesion, and he was treated for a while as a case of osteo-arthritis, being supported first with a webbing belt and later with a leather jacket. The pains persisted and a lateral x-ray of the spine was taken, finally, which showed its antero-posterior outlines with a slight crush of the body of the first lumbar vertebra.

At this time, fifteen months after the injury, the patient was walking about with his leather jacket on, but he complained of severe burning pain in his back near the level of the injury, but it did not extend around on to the abdomen. There was definite sensitiveness on pressure over the spine of the affected vertebra, and it was thought some of the posterior spinal ligaments probably also had been torn. A slight depression in the furrow of skin in the midline of the back could be made out coinciding with the area of sensitiveness. See Fig. 18. When the back support was removed, while the patient was standing there was marked spasm of the erector spinae muscles, and back movements were greatly limited in all directions. Knee jerks were active. The patient stated that he found his leather brace of great assistance in walking and

he kept it laced very tightly, but that it made his back ache if worn while lying down, so that he removed it at night. When he became very tired he took off his support and laid flat on his back on the floor. This change in posture produced a severe burning pain for a few minutes but afterwards there was relief as long as he remained quiet. Figure 19 shows the leather jacket and Fig. 17 is a lateral view of the patient standing. Two additional photographs are introduced representing other varieties of supports for fractures of lower dorsal and lumbar vertebrae. Figure 20 is a man who has a fracture of eleven months' duration of the first lumbar vertebra; and Fig. 21 shows a newly applied support for a fracture of the twelfth dorsal vertebra after nine months. The foregoing history will do equally well to illustrate clinical symptoms of certain cases of hypertrophic arthritis, and indeed this was the diagnosis which was made until x-rays positively identified the condition. It may be stated here that compression fractures of bodies of vertebrae often depend wholly upon x-rays for their positive diagnosis. They should be suspected whenever

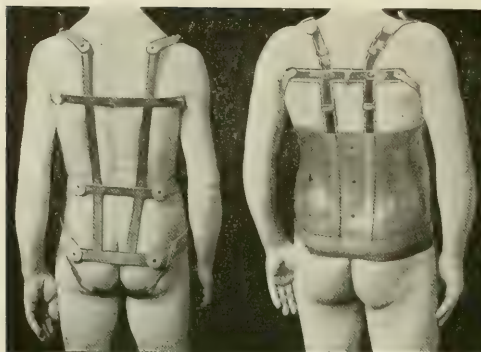


Figs.

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Figs.

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there have been severe injuries followed by long, persistent, severe symptoms.

VIII. *Hypertrophic arthritis of the spine* occurs typically in middle age or later, and represents usually results of wear and tear of life, including previous infections, and continual minor mechanical strains and stresses. It is very frequently actively started by trauma, and gouty deposits also are found often associated with such bony overgrowths.

Overgrowths are diffuse many times, but also form sharply localized exostoses in other instances. Fig. 25 is the photograph of the spine of an old man of eighty years, which shows extensive hypertrophic changes and osteoporosis. Abnormal bony processes are seen on bodies of vertebrae and around dorsal articular processes in Figs. 23 and 24. It has been observed that these overgrowths occur around edges of articular surfaces and at attachments of ligaments, that is, in localities subjected to repeated mechanical stresses and strains. In these places of lowered resistance calcareous deposits and patho-



FIG. 22.

logical osseous changes first make their appearance. In some instances they are produced so slowly by continuous slight strains that no painful symptoms are complained of; at other times, considerable pain and disability is produced in shorter time, as is observed frequently around hip joints. The proximity of articulating processes to vertebral foramina in dorsal spinal regions, taken in connection with the small size



Figs.

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24

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FIG. 26

of these openings, causes nerves sometimes to be pinched when these apertures are pathologically narrowed. At least this explanation accounts satisfactorily for occasional excruciating pains accompanying osteoarthritis referred to regions supplied by emerging spinal nerves. Fig. 22 illustrates variations in sizes of vertebral foramina, and in this specimen the stumps of ribs may be seen held in position by their own ligaments in exact relations maintained during life.

Fig. 26 is the x-ray of the lumbo-sacral spine of the patient figured in 27, 28, 29. It shows extensive hypertrophic changes about bodies of vertebrae and at sacro-iliac joints.

The old man of sixty-five, a gardener, came to see if he could get some support for his back. For four or five years he said that he had been slowly getting more and more out of shape, until finally at the time the photographs were taken he could stand erect less than an hour. He sat in a hump-backed attitude, complained only of weakness, and stated that he always had had a weak back but never suffered from severe pain. This case illustrates how slow extensive changes

may take place without interfering with usual activities of life. It seems plausible to believe that the continuous bending over necessitated by his work increased the bony changes in the back. He was fitted with a temporary plaster jacket, Fig. 28, which was put on with the patient lying flat on his face on a hammock. This gave him the desired support and a leather jacket is contemplated at the time of this writing to assist him permanently in keeping a better posture and to prolong his activity. Examination of his back showed an absence of tenderness, presence of some scoliosis, and the stooping, bow-legged attitude seen in Figs. 27 and 29.

IX. Infectious Arthritis of the Spine. A young man of nineteen noticed a gradual development of pain in the back and side along the right costal border. No trauma had been received. His occupation of letter carrier meant carrying thirty pounds of mail suspended from the shoulder in a bag. Soon after pain in the back was first noticed the patient's appendix was removed, and while lying abed the back symptoms subsided, but returned on resumption



Figs.

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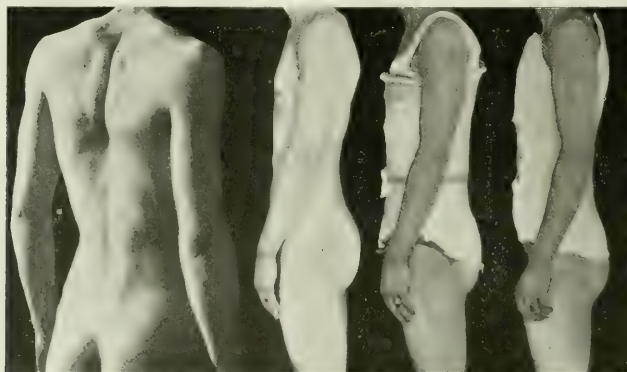
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29

of activity. One year after onset of pain the appearances shown in Figs. 30, 31, 32, 33 were seen. He is a slender person with contracted back muscles and with scapulae held far back in an involuntary effort to protect the dorsal region of the spine. Back motions were painful and limited. There had been no cough or previous lung trouble and pleural adhesions were excluded in the diagnosis. Fluoroscopic examinations of the appendix region, after the patient had taken a bismuth meal, showed the caecum hanging over the brim of the pelvis from which it could not be raised. X-rays of the back showed an absence of any bony changes in the vertebrae. Careful urine examinations and absence of renal symptoms in the past helped to exclude kidney disease. The nature of the trouble seemed, therefore, to be narrowed down probably to a postural weakness, or to an irritative lesion of bacterial origin, if not due to some very obscure unusual lesion. The existence of marked muscular rigidity without traumata weighed against simple postural weakness as a diagnosis, and instead suggested an active irri-

tation, perhaps a synovitis or the beginning of bone disease. Von Pirquet's skin reaction for tuberculosis was very weakly positive, and the patient accordingly is being treated as an early case of spinal tuberculosis, although the basis for this diagnosis is not entirely satisfactory. With a plaster jacket on, the patient's symptoms have partly subsided, and at the time of this writing it would be unwise to dispute the possibility of infectious arthritis originating from a bacterial focus around the caecum. There has been no urethral infection nor tonsillitis. Figure 30 shows the tense back muscles, and Fig. 31 gives an idea of the antero-posterior curves of the spine.

Jackets shown in Figs. 32 and 33 will be discussed later under treatments. Other infectious lesions of the spine are often designated, namely, those of gonococcal, streptococcal and staphylococcal origins. These are diagnosed very loosely, however, from associations of infections elsewhere in the body. The same statement is true of typhoid spines, and it is often impossible to disprove the existence of spinal symptoms of



Figs.

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33

syphilitic origin with past record of syphilis, although we do not recognize specific vertebral lesions usually from x-rays.

Significance of Anatomic Variations in Lumbar Spines and Sacra; Relaxed Sacro-iliac Joints; Physiologic Variations of Strengths of Back Muscles. The clinical significance of sacro-iliac joint lesions and of anatomic peculiarities of the lower spine have been made clear by Dr. Joel E. Goldthwait of Boston in a series of papers¹, and to him all credit for these observations is due. In this article, attention will be paid, therefore, to variable strengths of back muscles and ligaments, their causes and their importance, after reviewing briefly different anatomic variations which are likely to be encountered. All doubts as to the multiplicity of spinal anomalies can be dispelled by consulting the wonderfully complete collections of the late Prof. Thomas Dwight at the Harvard Medical School. Photographs of anatomic specimens used here were obtained through the kindness of Dr. William F. Whitney of the Warren Museum at Harvard. X-rays which give an idea of some anatomic variations most commonly encountered in routine examinations have been selected at random from hundreds of similar negatives through the courtesy of Drs. Walter J. Dodd and G. C. Holmes. And for many clinical records of patients the writer is greatly indebted to Dr. E. G. Brackett of the Orthopedic Department of the Massachusetts General Hospital.

To summarize, briefly, different structural peculiarities, there are slight displacements of sacra on ilia and vertebrae, on sacra occasionally. Transverse processes of fifth lumbar vertebrae at times are exceptionally long, and in different instances, articulate with sacra or iliac bones, or with both, while at other times they simply impinge upon adjacent structures and may, under certain conditions, perhaps, help to produce strains of lumbo-sacral articulations or sacro-iliac joints. Dorsal articulating processes of fifth lumbar vertebrae vary in development at times and may produce unusual strains and postures. Bodies of vertebrae may fuse with sacra, and sacra may fuse with ilia. Unusual anatomical developments may be unilaterally or bilaterally symmetrical ones.

Very important plexuses of nerves are located in the lumbo-sacral region and there are opportunities for them to become stretched or irritated when abnormal relaxations of the parts occur, especially in the presence of various anomalous bony developments or in slight displacements.

An interesting matter of practical importance is the reason why anatomic peculiarities sometimes produce severe symptoms in backs and legs yet perhaps more frequently cause no trouble whatever though structural variations are present of the same kind and of as great degree. So many striking variations in lumbo-sacral spines have been discovered accidentally

among widely differing conditions that many physicians still are inclined to minimize, or disbelieve entirely in the clinical importance of these many anomalies. All contradictory facts, however, can be explained satisfactorily by consideration of physiologic variations in strengths of back muscles and ligaments.

Effects produced by changing strengths in muscles and ligaments which support the vertebral column are better understood by comparisons with leg muscles in foot strain and flat foot. Structural peculiarities were first features to be understood in foot defects, as are indicated still by the phrases "falling of the arches" and "flat foot." Next it was observed that some individuals with high arches of the feet had painful symptoms, while some very strong, athletic persons possessed very flat feet with no abnormal symptoms; and then the term "foot strain" was introduced, "flat foot" dropping more and more into the background. Finally, strengths of muscles supporting arches of feet were measured from time to time, and it was scientifically proved that there is a temporary relative weakness in these particular muscle groups in foot strain. *Physiologic variations of muscle strengths and resistances of ligaments, not anatomic peculiarities, are usual actual starting points in production of abnormal functional symptoms, but anatomic variations may possess clinical significance as soon as muscles and ligaments weaken appreciably.* Treatment of foot strain no longer consists wholly in supporting weakened muscles with orthopedic strappings and metal foot plates. Attention is paid, also, now to internal medical measures, and to personal hygiene to correct obscure debilitating "auto-intoxicated" states so commonly associated with onsets of abnormal foot symptoms. Weakened muscles in calves of legs have their work minimized by mechanical supports, but simultaneously they are relieved by correction of vascular defects, for vascular irregularities influence all muscles since blood is the common medium upon which all tissues depend.

It should be recognized that backs may be influenced in ways similar to those affecting the feet. Blood of the same quality flows through back muscles and through the extremities, and they both show simultaneously its debilitating or invigorating effects. In some instances in which the feet are used but little, or if the back is naturally a little weaker, painful symptoms appear first in the back when its blood supply becomes poor for a sufficient length of time: while at other times feet give out before other parts. Back and foot symptoms are observed together very frequently indeed.

It is possible to strain muscles by excessive use and this sometimes happens. Changes of the quality of the blood alone on the other hand are apparently sufficient to produce gradually developing symptoms as seen in many cases of debility, without changes of occupation, and without changes of mechanical strain. The

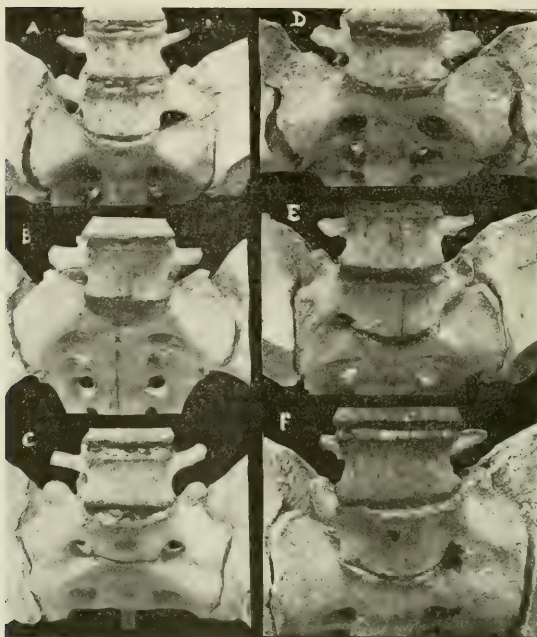


FIG. 34. Variations of lumbosacral region of the spine, showing differences in relations of lateral processes of lowest lumbar vertebrae. Also, variations in sacralizations of vertebral bodies.

causes acting in combination are most frequently observed. Back muscles cannot be tested conveniently like the feet, and direct scientific proof of the ideas just presented therefore is impossible; but this theory is well within limits of probability and can be accepted more safely than it can be ignored.

Everyone can readily see from inspection of the photographs of anatomic specimens, Fig. 34, how unusual articulations of transverse vertebral processes may strengthen or weaken the lumbo-sacral spine, making the two sides of the body differ in ways they react to pathological ligamentous relaxations.

Imagine a healthy person with strong muscles of the back, strong sacro-iliac joints, and prominent transverse processes of the fifth lumbar vertebra. If such an individual is overworked long enough and is mentally worried, overeats or has a loss of appetite with mild indigestion for a while, until finally he becomes "run down," there will be a slight lameness of the back slowly developing if relief is not obtained. Back lameness may go on to a dull ache in lumbar muscles, also typically there is a little sensitiveness over sacro-iliac joints. These symptoms are due, without much doubt, to continued slight defects in the circulating blood which lower the resistances of the ligaments and muscles and thus produce strains. In the majority of instances, relief from work, worries and digestive irregulari-

ties comes at this stage of the trouble, vascular irregularities subside, and back symptoms slowly disappear. Adhesive straps tightly applied across sacro-iliac joints help relieve these slight strains of ligaments and muscles, but there are no appreciable sacro-iliac relaxations nor do long transverse processes possess any pathological significance.

If a person happens to receive some unusual strain while in this debilitated condition, as in Case 2 cited above, there may be enough force exerted upon sacro-iliac joints to strain them severely, or possibly produce an extremely slight slipping of the sacrum upon one iliac bone as indicated by symptoms noted of "something giving way." No changes in relations of the joints usually can be made out upon examination, however, and long vertebral processes still possess no harmful significance.

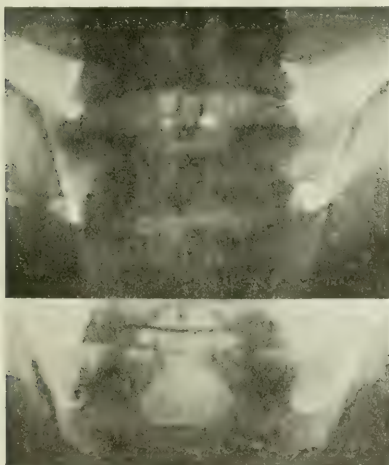
If back pains are neglected and slight relaxations of muscles and ligaments are allowed to continue, it is easy to see how these strains may gradually increase to greater laxities from continued vascular defects or from continuing excessive use of the back muscles. If such chronic relaxed types receive sudden severe wrenches sacro-iliac joints then perhaps may be displaced quite appreciably, and it is possible that transverse vertebral processes also may get caught against the adjacent ilia or sacrum and hold the bones in dislocated relationships with each other. Vertebral processes, however, sometimes may still have no significance, because it is possible for them to be long and yet be situated too far away to strike against adjacent bones; and under such

circumstances, of course, they would not help to stretch ligaments or nerves.

When they actually articulate with bones next to them they may be elements of strength, presumably, instead of weakness. It can be only rarely that unusual lengths of transverse processes and unusual relaxations of ligaments combine to produce harmful conditions.

A few x-rays of lumbo-sacral spines of patients are given in this connection for the sake of completeness and for comparison of anatomic peculiarities with pathologic symptoms. The history of each case is briefly summarized below, and they are grouped under three heads, *e. g.* shadows of transverse vertebral processes which overlap shadows of iliac bones and are associated with back symptoms; second, pathological back symptoms without overlapping shadows; third, overlapping shadows of transverse vertebral processes with iliac bones in patients without back symptoms.

FIG. 35. An Italian laborer, twenty-eight years of age, works in a lumber yard; and three years before he came for treatment he noticed pain gradually come on in the sacral region of the back. He received no definite single trauma. Pain has persisted more or less since its first onset, but has never extended down the thighs. After three years the symptoms became so bad that work was impossible and he sought medical care. Examination showed the back then held stiffly with all its motions much limited. Hip joints did not appear involved. A plaster jacket was put on in a standing posture as soon as the x-ray was taken, and the patient never returned for further treatment. Presumably he was relieved and did not bother to return.



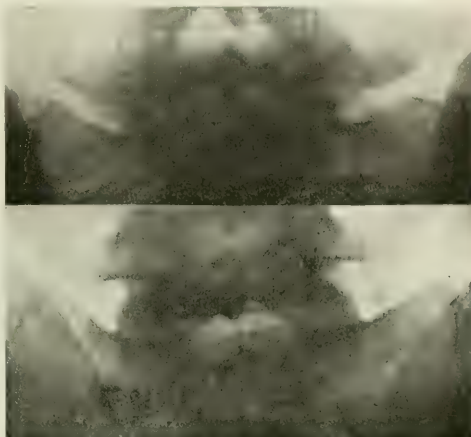
FIGS. 35 and 36.

FIG. 36. A small, thin man suffered with pain in the right leg for six months before he came for treatment. No trauma. Onset gradual. Pain was first noticed in region of the sacrum while patient was lying abed, later this symptom increased in severity and extended to calf and heel. Examination

showed all back motions limited and straight leg raising painful. There was considerable structural scoliosis with what appeared to be an acute strain upon the right side of the lower back. He made only two visits, had an x-ray taken, had supportive adhesive straps put on the back for two weeks, and then disappeared. He was partly relieved at his last visit.

FIG. 37. History given under Case 4.

FIG. 38. Worker in leather factory. A man of forty-nine years with pain in the left hip of six months' duration. Onset gradual. No trauma.



FIGS. 37 and 38.

Examination showed slight lateral deviation of the spine in standing, and tenderness over the left sacro-iliac joint region. The posterior superior iliac spine seemed to be more prominent on the left side. The back was strapped for two weeks and then he was lost track of.

FIG. 39. A ticket agent of thirty years was seized with acute abdominal symptoms, and his previous history of renal trouble led to an x-ray being

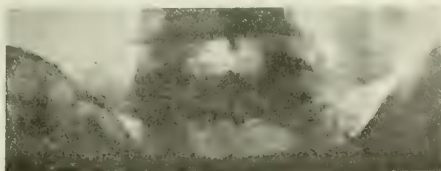


FIG. 39.

taken immediately. The picture shows incidentally an over-lapping of the shadows of transverse vertebral process with the shadow of the right iliac bone.

FIG. 40. A man of twenty-nine years, with renal symptoms and renal calculi, shows in the x-ray over-lapping of the shadows of transverse vertebral processes upon shadows of iliac bones.

Relaxations of Sacro-Iliac Joints. Articulating areas between sacra and ilia vary in size, shape and irregularity of articular surfaces as



FIG. 40.

photographs indicate in Fig. 41. All these pictures were taken at equal distances from the camera in order that they may be easily compared; and joint boundaries have been emphasized by dotted lines because original smooth fibrocartilages, which can be seen in position still, have shrivelled away from the margins of articulating areas in some instances.

Shallow depressions and elevations on these joints must be thought of as possessing very great importance in increasing joint stability and strength; and sacro-iliac joints should be imagined as two irregularly flat surfaces held together by continuous pull of elastic muscles together with extremely stout, non-elastic ligaments. It is a well-known mechanical fact that friction between two such irregular, tightly held surfaces requires great force to overcome it sufficiently to permit any sliding of the two surfaces on each other, if sliding forces act parallel to the plane of the joint. If there were no elevations nor depressions, sliding could occur much more

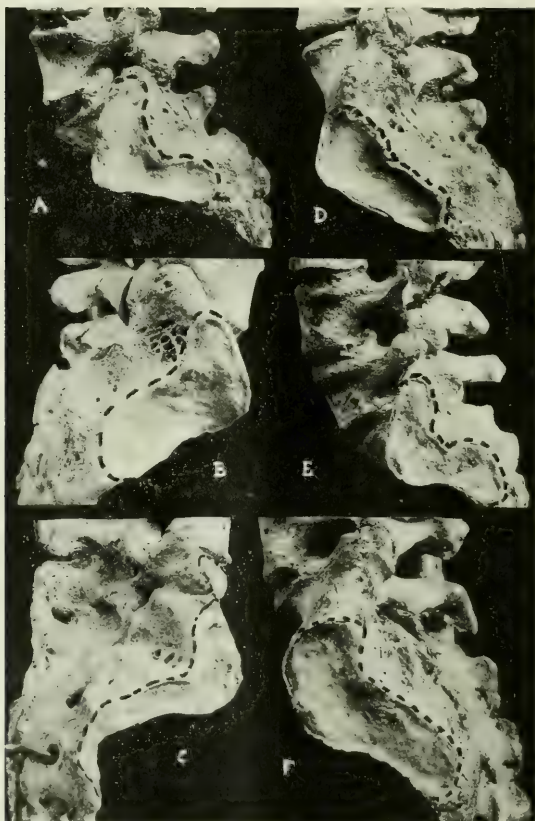


FIG. 41.

easily than it does when irregular hollows and eminences are fitted into each other between the two bones. This arrangement makes possible quite a little laxity of ligaments without appreciable slipping; and clinical observations confirm the fact that sacro-iliac articulations are constructed well enough to do their intended work in the very large majority of instances without large displacements.

Nevertheless there are a few rare cases of extreme relaxations, just as there are occasional extreme degrees of relaxations of ligaments of the feet, but severe symptoms are not necessarily associated with them. The weight of the body in very exceptional instances stretches lumbosacral ligaments and nerves so slowly that apparently the latter are able to readjust themselves to altered conditions without many pathological evidences. These extreme conditions are seen usually in delicate persons, generally women who do no lifting, who take no exercise, and who never are subjected to severe strains. Their muscles and ligaments slowly weaken under continuous, mildly debilitating vascular influences until finally the individuals get into very relaxed states; yet typically with only moderate pains after their mild activities.

Slight ligamentous laxities of short duration ought not to be thought of serious import in themselves for they occur normally in pregnancies; but such relaxations do weaken joints temporarily and make them susceptible to sudden twists and traumata. Before the joints can be automatically tightened and strengthened by contractions of muscles, injuries are more liable to occur. Tight ligaments always prevent possibilities of catching articulating surfaces relaxed with their hollows and elevations partly unlocked.

It seems to the writer, upon careful consideration, that we should speak of many lumbosacral symptoms as due to minute relaxations representing more than mild strains which are without any ligamentous stretchings, but, on the other hand, less than obvious relaxations that can be made out on superficial, hasty examination; and that corresponding with these microscopic laxities, presumably there are extremely minute displacements which cannot be distinguished on examination, but which patients appreciate and speak of frequently as sensations of something giving way in their backs.

Goldthwait has pointed to the fact that changes in sacro-iliac joints can be determined at the symphysis pubis in front of the pelvis. Upward and downward changes of positions in pubic bones upon the two sides of the midline of the body in relaxed symphyses necessarily represent similar relaxations posteriorly in rigid bony pelvic rings; because motions at the symphysis would be quite impossible if the two rigid innominate bones were held perfectly rigid against the sacrum. There must be slight relaxations of sacro-iliac ligaments at least to permit this play between bony surfaces in front.

To summarize all different sacro-iliac possibilities, clinical data seem to show that slight strains and microscopic laxities are common and that appreciable displacements are quite uncommon. Marked sacro-iliac displacements are produced very gradually without traumata in the manner which has been indicated above; second, they are produced by moderately severe injuries in presence of slightly relaxed joints, and third, in exceptional cases by very severe sudden twists in tightly held joints. In the three varieties of displacements painful symptoms respectively are intermittent and not very severe in the first; more severe and noticed whenever exercise is taken in the second, and extremely severe in the third class. The worst symptoms theoretically should come from very severe traumata acting upon very great relaxations.

This subject of relaxations has been dwelt upon at length because replacements of bones later have to be discussed.

No mention has been made of stretchings of anterior common spinal ligaments, but dissecting room material shows conclusively that laxities of these structures occasionally occur. And presumably signs of strain would be found in them very frequently in hollow backed patients if they were not hidden away so deeply in the body. So when sacro-iliac joints are singled out for special study it is well to remember that low back strains commonly represent multiple lesions of ligaments and muscles.

Variable Strengths of Ligaments and Muscles of the Back. If all persons possessed spines and pelves of exactly the same size and of the same anatomic pattern, there still would be variable strengths of muscles and ligaments left to act, and functional differences among them would be observed from time to time in the same individual, also there would be differences among different persons; so that strains, relaxations and displacements presumably would be observed then as now. Continued stresses and strains of muscles and ligaments themselves slowly produce anatomic changes; and it should be remembered, that, while congenital anatomic bony variations ought to be thought of as contributing causes for functional back symptoms and pains at times, at other times some bony variations simply show the results of previous physiologic influences acting upon bones throughout life. Too much emphasis should not be laid upon anatomic features on the one hand, nor, on the other, upon physiological peculiarities, because both factors are found always in combination, and they ought always to be considered together when interpreting clinical findings or in treating patients.

Vascular Causes of Variations in Strengths of Muscles and Ligaments. All tissues are directly dependent upon variable qualities of the blood, and we know roughly the following sets of clinical facts: 1. Rapidly growing, delicate children sometimes have deficiencies of hemoglobin in their blood, probably together with

other unrecognized vascular peculiarities, and these patients very commonly exhibit poor postures due to laxities of muscles and ligaments which result from the poor blood supply. 2. Gastro-intestinal putrefactions associated with secondary anemias and increased aromatic products of putrefactive decomposition in the urine are frequently accompanied by joint symptoms and similar relaxations of muscles and ligaments. 3. Retentions of urates in circulation in gout are associated with local changes in joints, cartilages, bones and ligaments. 4. Recent studies by Folin, Denis and Seymour² in nephritis show that retentions of non-proteid nitrogenous waste products are possible, and that such accumulated products in circulation are accompanied by backaches and joint pains along with gastro-enteric symptoms and feelings of lassitude. Backaches of Bright's disease have become universally known owing to numerous kidney cures, but in this scientific work can be seen how such symptoms owe their origin, in part at least, probably to direct debilitating effects upon muscles, of blood which is overloaded with nitrogenous waste products. Referred back pains of visceral origin may exist, but in view of this scientific work, assumption of their existence is not absolutely necessary for explanation of clinical appearances. 5. Various pathogenic bacteria gain access to the body and products of their growth circulate in the blood, and as a result, infectious joint symptoms, synovitis, muscle spasms instead of muscle relaxations and secondary anemias occur at times. 6. Cancer of the stomach may be latent, first symptoms complained of occasionally being backache, which then is found to be associated with loss of weight and beginning cachexia characteristic of new growths. Back symptoms in this instance seem apparently due in part to deleterious influences of impoverished blood. 7. Backaches occur with displacements of pelvic organs accompanied with irregularities of menstruation. Backaches also are complained of with relaxations of ligaments of the pelvis during pregnancies. It seems probable, therefore, that changes in pelvic vascularity may underlie slight back strains in menstrual troubles at times, while greater strains and relaxations are due in part to prolonged pelvic vascular changes of pregnancy.

Theoretically, any deleterious influence of the blood, as it acts on muscles and ligaments, may be a remote cause of muscle strain and postural back weakness although we do not know all circulating substances or vascular combinations which produce debilitating effects. It seems probable, upon physiological grounds, that vascular causes are fairly numerous. Therapeutic procedures, at least, should be directed always toward restoring blood to its usual standard in addition to prescribing physiologic exercises and mechanical orthopedic supports for weakened or irritated muscles.

Backaches of Other Origins. Rarer causes of backaches are local pressures produced by

metastatic cancerous growths in vertebrae and by fibromata of the coverings of the spinal cord. Neuritis of the peripheral nerves is caused by toxic influences of the blood sometimes and must be considered especially in the group of sciaticas. Diseases of nerve cells also must be included in a complete list, and herpes zoster and intercostal neuralgia have to be mentioned, as do the psychomyalgias and hysterical manifestations.

Small tears of numerous ligaments and small ruptures of back muscles probably give rise at times to sensations of something giving way, as well as slippings of sacro-iliac joints. Periosteal inflammations occur and myositis can be made out in some instances as localized sensitive lumps of contracted muscle fibres in the larger muscles. These disappear under gentle massage.

Adhesions of pleural and peritoneal membranes are spoken of rather loosely as causes of back pains, but these, together with so-called reflex pains of pelvic and abdominal origin, must be dismissed without further comment.

TREATMENT OF CHRONIC BACKACHE.

Treatments may be classified under:

1. Mechanical supports for weakened conditions.
2. Immobilization for irritated states.
3. Corrective orthopedic appliances for deformities.
4. Surgical measures; trimming superior angles of scapulae, bone grafts for fractured vertebrae, excisions of long transverse processes of lumbar vertebrae.
5. Physical therapeutic treatments,—hydrotherapy, massage, baking, electrotherapy,—for systemic hygienic effects and local stimulations. Gymnastics and manipulations for correction of deformities.
6. Drug treatments to alter and regulate various physiologic functions of the organism as a whole by changing vascular conditions.
7. Changes of diets to prevent accumulations of waste products in circulation.
8. Personal hygienic measures of rest, fresh air and sunshine.
9. Special measures of various sorts required in treatments of internal organs when the latter contribute to back symptoms.

Attention will be paid in this paper only to a few of the above mentioned treatments, as it is not necessary to emphasize, for example, that adhesive strappings are used very often to hold drooping shoulders in comfortable positions, that suitable strappings assist back muscles in positions of great strain by limiting forward bending, that they may be used to reinforce sacro-iliac joints and to lessen the work of gluteal muscles; while advantages of steel braces, leather corsets, plaster-of-Paris jackets, canvas belts and other apparatus are described in textbooks.

Variable Efficiencies of Orthopedic Treatments. The leather jacket in the case of frac-

ture of the spine, Fig. 19, does not hold the back as well as supports which hold the shoulders do. Figs. 20 and 21. It is doing some, but not the most, service possible with comfort. The plaster jacket in the case of infectious arthritis, Fig. 33, is more efficient in immobilizing the lower dorsal region of the spine than the one shown in Fig. 32; but, because of the slightly different posture, there happened to be developed new strains in the lumbar region which were not caused by the other jacket. Both were doing some good. The spinal-abdominal belt in static back strain, Fig. 4, made the patient feel so much better that she did not want a more efficient one, yet the lateral deviation was not corrected by it. The webbing belt in Fig. 16 was being worn so loosely that it was of limited use, and adhesive strapping, Fig. 15, held the patient much more firmly. Similar conditions were observed with the belt worn by the patient figured in 5, and strapping quickly produced improvements. It should be noticed in this case that wrinkled diagonal straps shown in the illustration were efficient in checking painful extremes of forward bending, although they look useless in the photograph. The little girl in Figs. 9 and 10 had been fitted with a spring back brace, but one of the shoulder straps had broken and the brace had been discarded entirely after a few months.

Satisfactory mechanical efficiencies combined with comfort in wearing of supports is frequently very difficult of attainment with different kinds of braces, jackets, corsets and belts. It is especially difficult to maintain these combined conditions *continuously* long enough to relieve chronic troubles for which such apparatus has been prescribed; and many things besides new kinds of appliances are needed. Of equal importance to final results are numerous economic and social factors, because they are included in the chain of circumstances upon which all successful treatments of chronic troubles depend. The weakest link in the chain, not the most elaborate one, determines the strength and success of the whole, and, accordingly, a broad view of the entire existing situation is desirable.

Some persons receive care irregularly on account of living in inaccessible rural districts and these circumstances are causes of poor success.

At the present stage of advancement it seems that patients have a right to demand of physicians, whether specialists or general practitioners, that they shall be reasonably familiar with theories of rational treatment of chronic diseases, and shall be able to distinguish whether appliances as being worn, are mechanically efficient or inefficient. If attempts are made at putting on plaster casts, physicians should have sufficient understanding of possibilities and limitations of various postures to make jackets really do the work for which they are intended. It is not too much to expect now that some attention shall be paid to personal hygiene, and to simple regulations of normal organic functions with appropriate well-known drugs. There

ought to be wide enough comprehension of conditions, also, to prevent medical gymnastics and exercises being given when rest and local supports are indicated, or *vice versa*, yet mistakes of these kinds are very commonly seen.

SURGICAL TREATMENTS.

These can only be mentioned and references given to more extended discussions of individual methods.

Transverse Processes of Fifth Lumbar Vertebrae have been removed by surgical operations, and subsequently back symptoms have promptly disappeared, but this procedure is open to the serious criticism that it does not prevent recurrences of sacro-iliac strains. It is quite possible that rest accompanying surgical operations relieves symptoms mainly instead of removals of tips of lateral processes.

There are instances of very undesirable after effects of such operations, so they seem unjustifiable to the writer except in the extremely few severe cases of long duration, of undoubted diagnosis, in which everything else has been tried without success.

This subject is discussed by different members of the American Orthopedic Association in connection with a paper by Blanchard and Parker.⁸

Fractures of Vertebrae generally are treated with plaster jackets and with steel back supports, but during the past few years bone grafts have been successfully made in these traumatic cases, and it seems possible results may show in the future that surgical measures will more quickly relieve chronic back weakness which such patients complain of for long times after their injuries. Unrecognized fracture of the spine without paraplegia has been recently reported in an interesting article by Dr. J. B. Hartwell.⁴

Scapulae Operations are very effective in permanently relieving a small proportion of cases complaining of shoulder pains. Middle aged patients with symptoms of many years duration show best results, and operations upon angles of shoulder blades are not open to serious objections that can be raised against those upon transverse processes of lumbar vertebrae. Details of late results of operations in these cases are given in a previous paper by the writer.⁵

Ether Manipulations for Sacro-Iliac Displacements are very successful in a few instances, and sharp clicks are felt or heard as reductions of slight shippings are made by means of hyperextensions of thighs, or twistings of the spine, and other manipulations. Rough handling, however, is likely to increase or change instead of diminish displacements. It is easy to see how this may happen from reference to the outlines and surface irregularities of articulating areas in Fig. 41.

The same force applied in the same way need not necessarily produce identically the same result in different individuals. If directions of forces applied therapeutically are not the re-

verse of those causing displacements they may substitute other displacements for ones already present, and there are no reliable methods of telling whether over-corrections are made or not because changes in positions of bones are so small. Bony variations are so common that differences noticed, upon deep palpation in sacro-iliac regions, of the two sides of the body are not always reliable, and certainly it is difficult to conjecture precisely what were the strengths and directions of sudden twisting strains which ushered in the pathological symptoms.

It is safe, however, to manipulate sacro-iliac joints gently when muscles are relaxed by ether. Success sometimes attends these efforts, and, if perfect replacements are not secured, no harm is done if care is used, because new strains produced in unsuccessful gentle handlings will subside during the period of recumbency at the time plaster supports are worn afterwards. Severe chronic cases are the ones to be subjected to this form of treatment, and the patient figured in 13 and 14 with persistent forward and lateral bending of the body eight months after onset of symptoms, illustrates a suitable case.

SUMMARY.

An attempt has been made to show that many things besides new clinical experiments and laboratory studies are required for improvements in treatments of backaches. The great value of careful surveys which are eliminative rather than additive in nature is insisted upon; and it is suggested that excessive accumulations of new data and therapeutic agents may hinder instead of accelerate progress, when they become so numerous as to overwhelm systematic classifications and rational conceptions, and if they compel practitioners to take handiest, most attractive untested novelties instead of most efficient methods and ideas.

Numerous details have been presented in a review of a few typical cases of different kinds of back troubles, and this review has been extended enough to indicate different anatomical, physiological, social and economic facts which must be understood for most successful management.

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² Malcolm Seymour: Interstate Medical Journal, Vol. xxi, No. 9, 1914, "Gastro-Intestinal Disturbance Due to Nitrogen Retention"; Folin, Denis and Seymour: Arch. of Int. Med., Vol. xlii, pp. 234, 234, February, 1914, "The Non-Protein Nitrogenous Constituents of the Blood in Chronic Vascular Nephritis (Arteriosclerosis) as Influenced by the Level of Protein Metabolism."

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⁴ J. B. Hartwell: American Journal of Orthopedic Surgery, February, 1916, "Unrecognized Fractures of the Spine without Paraplegia. A Study of 14 Cases."

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Original Articles.

FRACTURE OF THE LUMBAR VERTEBRAE AND TRANSVERSE PROCESSES. A REPORT OF FOUR ADDITIONAL CASES.

BY JAMES WARREN SEVER, M.D., BOSTON.

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In Surgery, Gynecology and Obstetrics for March, 1916, the author has already reported seven cases of compression fracture of the lumbar vertebrae following severe falls or accident. These four cases are an additional series, and bear out my previous statement that such fractures are much more common than is ordinarily supposed.

The fractures in these cases involved:

1. The twelfth dorsal and first lumbar and a portion of the fourth lumbar.
2. The first lumbar.
3. The twelfth dorsal, first and second lumbar.
4. The transverse processes of four lumbar vertebrae besides the disarticulation of the last rib on the same side.

They were all caused by falls from a height varying from 40 feet to 20 feet, with the exception of the last, this being a crush by a heavy truck wheel.

I will not go into the mechanics or general discussion of these cases, for these points have already been covered by my report of the previous seven cases.

A summary of the location of the fractures in the eleven cases is as follows:

Location of fracture.	Individual vertebrae included.
12th dorsal	2
1st lumbar	5
2nd "	4
3rd "	1
4th "	3
5th "	2
TOTAL	17

Location of fractures in individual cases:

1. Twelfth dorsal—first lumbar and a portion of the fourth lumbar.
2. First lumbar.
3. Twelfth dorsal and first and second lumbar.
4. The transverse processes of four lumbar vertebrae including the distraction of the articulation of the twelfth rib on same side.
5. The first lumbar.
6. The first and second lumbar.
7. The second lumbar.
8. The second and third lumbar.

9. The fourth lumbar.
10. The fourth and fifth lumbar.
11. The fifth lumbar.

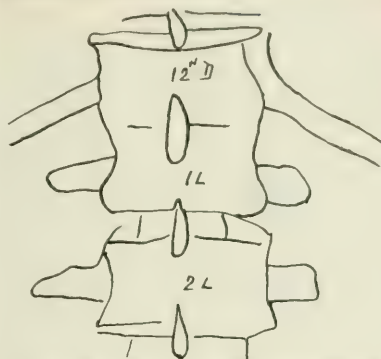
It may be seen from a study of these two tables that the first and second lumbar vertebrae are the most frequently involved, with the fourth following next in order.

CASE 1. F. N., age 48, carpenter. This man had a fall of 45 feet on May 28th, 1915, following which he was taken to a private hospital, where he stayed in bed eleven days. He then went home and later went to work again as a carpenter's foreman on August 16th, 1915. He was made unconscious by the fall, but so far as he knew suffered no broken bones, and received nothing but a strained back and a general shaking up. He never had any trouble with his legs, either in sensation or ability to move them, and he had no incontinence of his bladder or rectum.

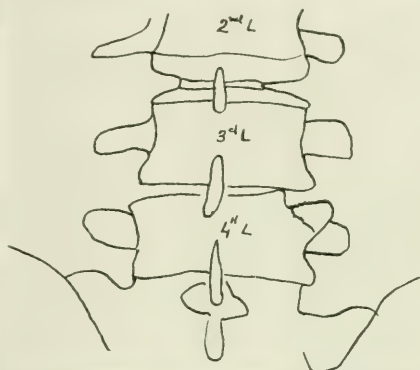
I saw him first on October 9th, 1915, because of constant pain in his back, he having been sent to me by his own physician. An x-ray was taken by me, which showed that he had sustained a fracture of his twelfth dorsal and first lumbar vertebrae, besides breaking off a corner of the fourth lumbar vertebrae. See tracing of x-ray Nos. 1 and 2.

There was some diminution in the height of the twelfth dorsal and first lumbar vertebrae, and marked bony proliferation between them so that they were practically one vertebra. There was no lateral displacement or tipping. The fourth lumbar showed the upper left corner broken off, and displaced downward and outward. There was also some asymmetry of the body, but I could make out no definite crush of the body. Clinically, he had a very stiff, lame back with limitation of motion in forward and side bending, and considerable muscle spasm. He was fitted to a spring back brace which gave him some relief. There was no kyphos and no nerve involvement that could be determined. Not knowing that he had a fractured spine, this man was able to go back to work and do more or less his usual routine, until after he found out what the actual condition was. Then he at once developed considerable disinclination to work, and the mental change was quite striking, as soon as he knew he had a "broken back." He will be able to work as before, but probably will not ever be able to do heavy lifting or much stooping or bending, without more or less discomfort.

CASE 2. W. C., female, aged 25, single. During the night of April 2nd, 1915, this young woman walked out of a second story window in her sleep. She fell about 12 to 15 feet into soft ground where she was found later, unable to get up. She was taken to a nearby hospital where she stayed for seven weeks, and where she was treated for several weeks for hysteria. She stated that she lost feeling in her legs at once, but could always move them. Two weeks after the fall, she became incontinent, which condition continued for nine weeks. At first she had considerable pain in her back all the time, but has had none of any moment since nine weeks after accident. Three months after the accident she could walk alone with a cane, and now (September, 1915), can walk about 100 yards alone. Is able to get up and down stairs, only with considerable difficulty.



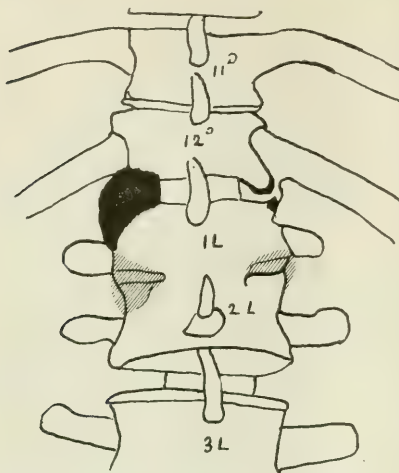
No. 1. Same case as No. 2. Note fusing of 12th dorsal and 1st lumbar.



No. 2. Note fracture of upper left corner of 5th lumbar vertebra.

Examination showed a poorly developed and nourished young woman, who walked with difficulty with a cane. There was considerable backward tilt to the trunk, and toe drop of right foot in walking. The abdomen was scaphoid. The spine not very flexible, with considerable increase backward in the dorsal convexity. There was a suggestion of a kyphos in the dorso-lumbar region standing up. The knee jerks were very faint, especially on the right. The thigh muscles were apparently normal, as well as the hamstrings. The right foot was held in equinus and showed that the gastrocnemius, and common extensor of the toes were very weak. The left foot was apparently normal, except for a weak gastrocnemius. Sensation was diminished only slightly on the right lower leg, and over the buttocks and upper thighs posteriorly in a saddle shaped area. In lying prone the kyphos was more marked, and was evident over the twelfth dorsal and first lumbar region. X-rays, see tracing No. 3.

The x-ray showed that she had sustained a crushing fracture of the twelfth dorsal and first and second lumbar vertebrae. There was an asymmetry of the body of the twelfth dorsal, the body being slightly wedge shaped, the apex pointing toward the left side. There was also evidence of a more extensive crush of the body of the first lumbar, it



No. 3. Fracture of 12th dorsal, 1st and 2nd lumbar vertebrae. Shaded areas represent callous formation.

apparently having been reduced in height considerably, as compared with other normal bodies of that region. There had been considerable new bone formation about the edges of the vertebrae, especially on the right side of the twelfth dorsal and first and second lumbar, with partial obliteration of the intervertebral space between the twelfth dorsal and first lumbar, and total obliteration of this space between the first and second lumbar bodies. The tracing of the x-ray is not very accurate, but was the best I could get. The shading represents the callous formation.

She was fitted to a back brace, which improved her walking and standing, and gave her more comfort. She evidently had had some cord injury, which accounted for her paralysis at first, and the present condition. She is gaining slowly, and in view of this fact, I felt that she might continue to gain for another year or so. If at the end of that time she was no better, or if she became worse meanwhile, some other procedures could be devised to help her. At present she seems to be doing about as well as she could with massage, electricity, and muscle training.

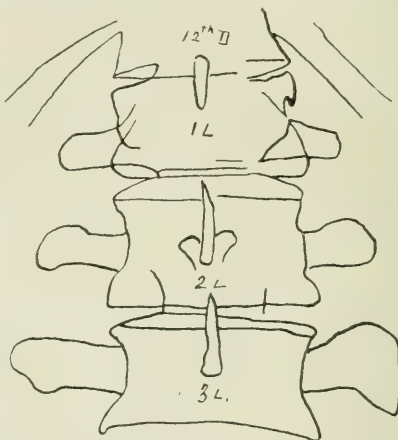
CASE 3. F. W. G., male, aged 43, carpenter. Accident, April 28th, 1915. This man fell a distance of about 30 feet from a gutter to the ground. He landed with his buttocks in a soft flower bed, and his back on the turf. He was conscious at first, but soon became unconscious. He was taken to a nearby hospital where he stayed 14 days. Besides hurting his back, he fractured two ribs on the right side, low down. He also sustained a fracture of the right wrist, and of one of the metacarpal bones of the right hand.

After leaving the hospital he went home and stayed in bed a few days, and three weeks later was able to go to Boston. Since July, 1915, he has worn a spring back brace.

This man never had any disturbance of sensation in the legs, could always move them freely, and had no loss of control of his bladder or rectum. I saw

this man five months after the fall, and he was still complaining of some pain and a soreness in the back. Examination showed that his back was fairly flexible except to side bending. There was no kyphos, but he was tender over the region of the fourth lumbar. No disturbance of motion or sensation of legs. Knee jerks normal.

The x-ray of his back (see tracing No. 4) showed that he had a compression fracture of the first lumbar vertebra, not very marked in degree and causing no especial deformity. He was advised to con-



No. 4. Crush fracture of 1st lumbar. Note irregular outline of body of 1st lumbar and decrease in thickness of body.

tinue with his back brace, and not to try to do heavy work. In time I should think that he could do his usual work.

CASE 4. G. F. F., aged 49, male. This man was injured on September 27th, 1915, by being run over by the hind truck of a heavy pole carrying machine. He fell from the front truck, as the horses started quickly, and tried to get out of the way of the hind wheels, one of which apparently passed obliquely over his left flank, from below, upward. He was unable to stand up, but lay on the ground until found later and taken to the hospital, where he stayed about five weeks. Since going home his back has been painful, sore, lame and stiff, and he is unable to work.

Examination showed that his back was very stiff and irritable, especially in the lumbar region, and his forward and side bendings were considerably restricted. It hurt him to twist and hurt him considerably in getting up and down from the bed. There was no apparent deformity of the spine except that he had a slight right lateral curvature, probably occupational. His legs were normal and his sensation and knee jerks were normal.

The x-rays of his spine showed the following rather unusual condition, but in view of what happened to him just about what might be expected. (See tracing No. 5). The left side of the lumbar spine showed that the articulation of the last rib had been partly torn away, the tip of the transverse process on the left of the first and second lumbar vertebrae had been broken off, and practically the whole of the transverse process of the



No. 5. Note fracture of transverse processes on left, with partial disarticulation of 12th rib on left.

third and fourth lumbar vertebrae on the left, had been broken off. There was no apparent injury to the vertebral bodies themselves.

This injury was the result of direct violence, and if the man had not been fortunate in being heavily dressed, would have caused more damage. He should make a good recovery with support to his back, but will always probably have a rather stiff and lame lumbar spine, which may cause him discomfort and some disability.

NOTE:—Since the above paper has been in the hands of the Editors, the author has had four more cases, all without nerve symptoms except one, who has partial leg paralysis as a result of a crush fracture of the 9th dorsal and the 11th and 12th dorsal and 1st lumbar bodies. The other involved the 1st and 2d lumbar: the 12th dorsal, the 1st and 2d lumbar: the 1st and 2d lumbar; and the last the 1st and 2d lumbar likewise. All these cases were the direct results of falls, from heights of from 60 to 12 feet. This makes a total of 15 cases.

OCCUPATION AS A REMEDIAL FACTOR IN HOSPITALS FOR THE MENTALLY SICK.*

By EMILY L. HAINES, BOSTON.

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THE character of a hospital is such that we may say, with safety, that no one has entered as a patient with an expectation of pleasure.

* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 18, 1915.

We can also say, with equal safety, that many patients look back upon their sojourn in hospitals with pleasure, as well as with lively gratitude. In support of this statement, there are found in each hospital patients who, after their recovery, have insisted upon remaining longer in the institution.

There is, in fact, very much that gives pleasure to the patient; but, as in life outside the gate, it depends upon the patient and his or her power to enjoy.

There is an impressive proportion of patients who might still be left to the doom of daily tedium and aimlessness, but who instead rise daily with some feeling of purpose, and retire at night with more or less of the sense that the day has meant something, and that something has been done. This recovered sense of purpose has come with the discovery that they, the patients, are again capable of action and of work.

The increased activity that prevails in our hospitals for the mentally sick has come from the full persuasion that work is the great remedial principle, and that occupation, in a greater or less degree, and for each according to his or her personality, gives to each day diversion, interest and benefit.

What this means, not only to the individual patient, but to the large aggregation in our state institutions, is understood from the fact that on October 1, 1914, there were in the 13 state and 25 private institutions for the insane, in Massachusetts,—14,619 insane patients.

This large number of mentally ill is continually increasing. The patients must be cared for, and as many as possible must be returned to their former places in the community. Some will be able to pick up but a part of the broken threads of their former life, and others—a large number—will have to remain patients in the institutions for a prolonged period of time.

Work by patients has always been done to some extent in the hospitals of Massachusetts. In the earliest records of the hospitals of this state, work has been emphasized because of its beneficial effect upon the patient, mental and physical: for the pleasure derived from work and also for the economic value of the labor to the institution.

Occupation has a curative effect upon the patient, and labor has been recognized as desirable for both the patient and the institution. Patients have been given a part in the household duties, outdoor work upon the farm, and in various trades.

The first report of the Worcester Lunatic Hospital, 1833, points out that the convalescents should not be idle. The second report of the same institution remarks: "It is believed that an appropriation for additional means of giving occupation to the patients,—such as shops for various mechanical and handiwork pursuits—would answer a valuable purpose."

The making of shoes was begun in the winter of 1837. Mattresses, and basket-making are mentioned in the 9th report—1842.

A description from the 7th annual report (1840) of this same hospital gives us a clear impression of hospital life at that time. The opening of the day's work is set forth in the following vivid portrayal:

"The regular laborers are called for, the farmer knows whom to call to his assistance; the overseer of the shoeshop comes for his workmen; the washers are conducted to the wash room by their attendant; the laundress goes for those who labor in her department; the seamstresses assemble in the sewing room, and the woodman, with saws and axes ready, summons as many patients as he has tools provided for to saw and split the wood.

"In each department, before the laborers are called for, the overseer has everything in readiness to commence immediate operations. Before this time the cows are milked and fed, the pig-gery is well provided, the horses are fed and harnessed by the farmer and those individuals who are designated for this duty. A number of male patients are engaged in outdoor duties before breakfast. The washerman assists in making preparations for the labor of the day, one man collects the clothes for the laundress; another feeds the poultry and a third roasts and grinds the coffee; in summer one man drives the cows to pasture, another goes to the post office, and another cleans the harnesses, horses, etc.

"Those patients who remain in the halls are scarcely less busy. In the female department sweeping, knitting, sewing, reading, writing, swinging, walking and games occupy the attention of nearly all the patients.

"In the male department those who do not labor abroad engage in walking, games of various sorts, such as draughts or checkers, chess, backgammon, the different games with cards, reading, writing, conversation, politics and theological controversy, music, etc."

It can be readily seen that the increased number in our institutions has made it a difficult and almost impossible task to occupy all the patients by these modes of employment. Many need just the kinds of work we have enumerated, while to others such occupations are ill suited. In many cases the patients would not be interested and would not enjoy the work. Finally, the patients are often in too disturbed a state for coöperative occupation.

Thus there is a large number for whom some other occupation must be found which will make the time pass more agreeably and will relieve the monotony, and which will tend to benefit the patient's mental and physical condition.

Occupation must be found for the old lady who has been 20 years, or possibly more, in the hospital, and who probably spends most of the day in her chair. Again, for the younger woman who has been carefully nurtured, and who will be glad of an interest which will furnish

a tie with the outside world. There is, likewise, the case of the young student. Many of these require the stimulus of something new to them, and which is not strictly utilitarian.

To reach this large number of mentally ill, many occupations, therefore, must be provided. These must extend and progress from the simple to the complex, so that each patient, so far as practicable, may be benefited.

It thus has come about that, in addition to the class of occupations mentioned in the report from which we have quoted, many kinds of handwork have been introduced into the hospital curriculum. As a consequence, two or more instructors are engaged in each hospital in teaching new kinds of work, and in continuing the branches of work which are already being pursued.

This occupational work is carried on in the industrial rooms and upon the wards.

The ideal industrial room should be light, sunny, and in every way attractive, and should possess unforeseen appeals and possibilities for work which will invite daily attendance. The atmosphere of such a workshop is a change from the life upon the wards, and the patient clearly enjoys it.

For the patient who is unable to leave the ward some kind of work is provided. Such a provision is not merely advisable but directly promotes the well-being and peace of these patients. It is a pleasant sight to see a group of 8 or 10 white-haired women sitting in a sunny corner of a ward, sewing or knitting. We feel that they are enjoying the work together.

In the list of occupations, some necessarily stand out with greater prominence. For some years the weaving of towelling, denim, blankets and rugs has been done by men, and to some extent by women. In the past two years, to the looms already in use a total of 39 looms have been added in nine of the institutions. During the last few years fine shuttle weaving has been introduced. This work gives exercise, requires concentration, and possesses ever new possibilities in color and design, which gives delight and enthusiasm to the weaver.

Many patients in our hospitals take the same pleasure in the creation of something beautiful and useful as does the skilled worker outside, and appreciation is as welcome to the patients as it is to the outside worker. All cannot, nor do all hope to be, skilled workmen, but there is enjoyment and pleasure to each in his own achievements and in the success of his neighbor, who perhaps has progressed beyond the trials of the amateur.

Basketry is another mode of occupation which is valuable. The basket grows quickly, has a purpose, and is often the beginning of an interest in itself and in other kinds of work.

Again, rug making is one more industry which gives opportunity for several varieties of work. Many of the hospital stores come in bags of burlap. These are generally more or less

turn. They are passed through the laundry and then given to patients to be raveled, knotted, and made into skeins. The patients doing this may lack mentality for more complicated work; but it is an occupation, and is of value outside a form of "busy idleness."

In one of the hospitals, a woman, who had spent her days for over 20 years sitting with her hands to her head, and had done really nothing, has recently been induced to ravel burlap, and knot and wind. Now, as a result, she is not satisfied until, each morning, the nurse has given her her work. She sits with a chair in front of her, around the back of which she winds her skein, and she is a picture of contentedness. The skeins are dyed and then wound into balls. These burlap strands are used in fine weaving, in rug weaving, and tied and hooked rugs.

Pottery is one of the latest of the crafts to be introduced in state hospital work. Three hospitals already have their own kilns, and further development in this branch of work is foreseen.

In addition to these several kinds of occupational work, metalry, leather work, knitting, crocheting, embroidery and plain sewing all have a place and serve to provide a choice of interests.

To further the work of therapeutic occupation eight state hospitals in Massachusetts last year gave a course of instruction in occupation to nurses, as a part of the regular training school course. The instruction varied in different hospitals, but included lessons in basketry, weaving, leather work, metal work and pottery; also knitting, crocheting and embroidery. This instruction is not only of benefit to the patient and the institution, but is of value to the nurse, whether she elects institutional or private work. And, quite outside this factor, should the nurse never use the knowledge, the experience thereby acquired in manual work is amply worth the time and effort given.

With the nurse upon the ward, interested in having her patients employed, a greater number can be systematically reached.

We have, in a few words, tried to show the ends that may be attained by occupation as a means of treatment in our hospitals. We have shown how, by the varied modes of this treatment, the patients may become gradually vitalized with interest, the dull monotony of their days alleviated, and they are sent on the path towards recovery. Moreover, patients have not only been restored to health, but in some instances have left the institutions prepared to practise as a profession or trade the work in which they have become interested, and more or less expert, during the course of their treatment.

Occupation, as a remedial measure, is a field of wide and far-reaching possibilities. In its exercise it draws upon all the arts, and becomes enriched by everything of color, of form and of

design. It presents a fair horizon, towards which many may wander, and by various paths to the desired goal of peace and restoration.

ALCOHOL IN RELATION TO MENTAL DISEASE.*

By A. J. ROSANOFF, M.D., NEW YORK.

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THE question of the use of alcoholic beverages may be considered either from a moral or a scientific point of view. Personally, I prefer the latter; not because of any notion that the moral issue that is involved is of the lesser importance; but because I believe that the question in its moral phase will answer itself automatically, as soon as we have become clear with regard to its scientific phase, and, in any event, not before.

Accordingly, I come to you not as a temperance propagandist, but merely as a physician interested primarily in the preservation of human health, particularly mental health, on account of having for many years now devoted almost all of my time to the study of mental disease.

I would indeed say, to begin with, that if alcohol is beneficial, then there can be no moral objection to its use. If, however, the facts should show us that alcohol is, on the contrary, harmful to health, then, it seems to me, it would be neither moral nor prudent for us to fail to take cognizance of that showing, and to fail to allow it to guide us not only as individuals, in our private lives, but also as citizens, loyal to the welfare of the community of which we are a part, and working for improvement in its laws and customs.

I. SUBJECTIVE MANIFESTATIONS.

A person who has taken a moderate amount of alcohol is conscious, as a rule, only of pleasing effects; there is an increased sense of physical well-being, a happy-go-lucky mood, a certain freedom from that more or less painful shyness or reserve in conversation, with which most of us are more or less familiar; and from the standpoint of the man who has become habituated to the use of alcohol, there is nothing more to the whole question.

Consciously or unconsciously, the drinking man is even apt to harbor a prejudice against any external evidence that may be offered showing alcohol to be in any way harmful. Though he may be credulous enough in other matters, he becomes in this connection remarkably conservative and skeptical.

On the other hand, he is apt to give the flimsiest arguments in justification of his drinking.

* Read before the Conference of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Nov. 18, 1915.

Professor Kraepelin of the University of Munich, who is a celebrated authority on the subject of alcoholism, and whose observations and opinions I shall have to quote many times in the course of my address to you this evening, has recorded some of the more amusing arguments which, I think, will interest you.

One patient said, "I bought the drink with my own money."—Another said, "When there is no work one goes to the saloon; where else is he to go?"—Still another, "When I don't drink beer I am not well; I should die in six months if I drank only water."—One laborer even said that when he takes the proper amount of beer at noon then after four o'clock his work is no longer an effort for him, as "after that the beer does the work."—"While it is the heat of the fire or the warmth of the work room that drives the blacksmith, the brassworker, the glass-blower, and the baker to the whiskey bottle, the same service is performed for the cab driver and the watchman by the cold night air. Brickmakers, working in dampness, as well as millers and plasterers, compelled to inhale dry dust, find their salvation in drink."—An employee of a steamship company said, "In such a large business one could not get along without drinking."

It is not uncommon for drinking men to regard all talk against drink as mere puerility; one, for instance, held the idea that to live without drink was an impossibility; and when told by his physician that Professor Kraepelin, for one, lived entirely without it, he said, "Go on, Doctor, the professor takes his toddy just like everyone else!"

The most that a drinker will generally admit is that one should not drink to excess. Close questioning, however, is apt to bring out the idea that drinking to excess here means drinking to the stage of paralysis. One man, a case of alcoholic dementia, told me that he drank on the average a pint or a pint and a half of whiskey daily. "As to drinking to excess," said he, "that I never did; I was always able to navigate."

Let us now turn to the scientific data pertaining to the effects of alcohol.

II. LABORATORY EXPERIMENTS WITH ALCOHOL.

In 1903, Dr. L. Schnyder, of Switzerland, carried out a series of experiments to test the effect of moderate doses of alcohol upon muscular work. At about the same time Dr. A. F. Hellsten, of Sweden, carried out a similar series of experiments. Muscle efficiency was tested in the laboratory by means of an ergograph after the subjects had taken alcohol, and compared with the efficiency shown by the same subjects without alcohol.

I might add here that an ergograph is an instrument invented by Professor Mosso, an Italian physiologist. It consists essentially of a board, on which the subject of the experiment rests his arm, and at the end of which there is a pulley; the cord passing over the pulley has

at one end a brass ring which is grasped by the subject's index finger, and at the other end a weight of about two pounds. As the subject bends his finger he raises the weight, at the same time automatically registering on a strip of paper the height to which he has raised it. Of course, no subject can repeat this operation indefinitely; before long, fatigue sets in and the record on the paper begins to show a gradually lessening height, until finally complete exhaustion of the muscle renders impossible any further movement of the weight at all. The total performance is then calculated from the number of times and the heights to which the weight has been raised.

Both observers, working independently, were led by the results of their experiments to formulate practically the same conclusion, which may be stated as follows: the effect of alcohol is twofold, as a food and as a poison, producing at first a rise in muscular efficiency, and in about fifteen minutes the beginning of a rapid and progressive decline, the net result being a loss amounting to about eight per cent.

In 1900, Dr. E. Kürz, working in collaboration with professor Kraepelin, instituted a series of experiments in the laboratory of the University of Heidelberg, with a view to determining the effect of alcohol upon simple mental processes, such as are involved in additions of one place numbers, free associations of ideas, and memorizing numbers.

These experiments and the methods of sizing up their results are very complicated, and an attempt on my part to describe them to you would lead us too far into technical details; suffice it to say here that the general result was a reduction in the efficiency of these mental processes, varying in degree from three to twenty-seven per cent.; doses taken daily produced an increasing cumulative effect, so that it seemed that each successive dose added its effect before that of the preceding doses had completely worn off.

Numerous experiments similar to these, and others differently planned, have since been performed in laboratories all over the world with practically the same results; so that we are forced to conclude that moderate doses of alcohol impair both physical and mental efficiency, and that such doses, if taken daily have an increasing cumulative effect.

III. ALCOHOL AND INSANITY.

Let us proceed now to consider briefly the effects upon the mind of prolonged and intemperate drinking. These effects are most clearly shown by the end products of such drinking as they may be observed in hospitals for the insane.

The most recent available statistics of the New York State Hospital Commission, show that of all male first admissions to the state hospitals of New York during the year ending September 30, 1913, alcohol figured as a cause in 22.2%. This does not include the 12.4% in which there was

also a history of intemperance, but the insanity, in the judgment of the physicians who furnished the statistics, was not attributable to it; nor does it include the 43.8% in which alcohol was said to have been used moderately. In view of what has been learned concerning the effects even of single moderate doses of alcohol, I think it is impossible not to feel that some unascertained degree of harm has been produced by the alcohol, even in the two last mentioned groups of cases, although a conservative judgment has refused to attribute a causative influence to it.

Among the female admissions the percentages are much lower, as might be expected.

I offer these New York state statistics, I assure you, without the slightest feeling of pride. I am quite sure your state could make a very similar showing.

Let us now analyze a little more closely the 22.2% of cases which I have mentioned as having alcohol as a cause. They may be divided into two sub-groups.

One of these sub-groups consists of forms of insanity which develop mainly on the basis of an hereditary tendency, and which often enough occur without alcoholism; here the alcohol acts in the manner of a *contributing cause*.

The second and larger sub-groups consist of the so-called alcoholic psychoses, by which is meant forms of insanity of which alcohol is an *essential cause* and which, independently of intemperance, are not known to occur at all.

The more important of these are *delirium tremens*, *acute hallucinosis*, certain characteristic *delusional states*, the *polyneuritic psychosis*, and *alcoholic dementia*. The first two are acute recoverable conditions which, however, are frequently found to be of a recurrent nature, owing to a strong tendency shown by the patients to return to habits of intemperance after discharge from the hospital. The delusional states are for the most part, chronic, persisting for years, if not permanently, in spite of commitment to a hospital and complete withdrawal of alcohol. The last mentioned two conditions are likewise chronic, being characterized by mental deterioration.

IV. RECAPITULATION AND CONCLUSION.

I do not know what impression my address has made upon you. I have been told that Professor Kraepelin has many times lectured against alcohol to gatherings of men in beer halls as they were sitting around the tables, listening to him with a half amused, half cynical air, all the while consuming beer by the liter.

I think, however, all will agree with me that, assuming my very incomplete presentation to be essentially correct, the facts, if we pay heed to them, would lead us away from the saloons and not towards them.

What makes at all possible the existence of the problem of alcoholism is the fact, already mentioned, of its pleasing subjective effects and

of its acting in some respects as a food. Thus, if you will permit me to turn again to an observation of Professor Kraepelin's, one of his patients said, "In my day I have lived on beer and I have lived on whiskey; I never was much of an eater."

It is unfortunately not possible to enjoy the pleasures of intemperance without at the same time undergoing its far more serious ill effects; and as a food alcohol hardly merits consideration; for, what's the matter with oatmeal, Boston baked beans, chicken à la King, layer cake with maple frosting, and so forth, and so on? Anyone who is not satisfied with this and all else that is available in the line of foods, but is bound to derive his nourishment from whiskey or beer, is certainly fussy, to say the least.

What I have told you may be summarized more briefly as follows:

1. Even moderate drinking especially when it becomes a daily habit, though not likely to make anyone insane, is sure to reduce physical and mental efficiency, thus killing the best that is in one as long as it is indulged in.
2. Many persons, who have an inborn predisposition to mental disease, but who, had they abstained from alcohol might have avoided an actual breakdown, have been brought to hospitals for the insane by habits of intemperance.
3. Much larger numbers have been brought to hospitals by the same cause who, we know for certain, would never have developed their insanity were it not for their intemperance.

I would not have you think that I have begun to tell you all about the effects of alcohol; owing to the limited scope of my address, I have not even touched on the part played by alcohol in producing certain physical diseases, such as chronic gastritis, cirrhosis of the liver, and inflammation of the nerves; every insurance company has statistics showing how much higher the mortality rate is among those who drink than among those who abstain; nor have I touched on the relationship which there is between alcoholism and vice, crime, pauperism and other social evils.

Considering this, it is fitting, it seems to me, that I should close not with my own words, but with the more comprehensive and impressive words of Charles Darwin: "Through the long experience of my father and grandfather, extending over a period of more than one hundred years, I have reached the conviction that no other cause has brought about so much suffering, so much disease and misery, as the use of intoxicating beverages."

CEREBRAL SYPHILIS: A METHOD OF TREATMENT BY PROLONGED INTRA-SPINAL INJECTION OF SERUM UNDER HIGH PRESSURE.

BY JAMES B. AYER, M.D., BOSTON.

It has been shown by numerous experiments that injections of moderate amounts of fluid into the spinal canal under normal pressure reach no higher than the medulla. Correspondingly, syphilitic affections of the brain, notably general paresis and optic atrophy, are less influenced by intra-spinal salvarsanized serum than are cord affections. Hence the attempts at cure by intracranial injections of different kinds, as recently recommended by a number of writers.^{1, 2, 3} These methods appear reasonable, and in some otherwise refractory cases are undoubtedly effective; but they offer the serious handicap of frequent surgical operation on the cranium, and in the case of intra-ventricular puncture of penetration of brain tissue by the injecting needle as well. Moreover, by placing serum in the fluid channels of the brain at normal pressure we have no right to say that it penetrates the brain substance.

The writer is much impressed with the experiments of Weed⁴ in which this author found it possible by means of prolonged spinal injections of potassium ferrocyanide and iron ammonium citrate at pressures above the normal of the spinal fluid to precipitate Prussian blue in the cerebral perivascular spaces and even the capillaries and substance of the brain.

With Weed's experiments in mind, the writer attempted to duplicate his work in man. On four occasions three patients have been subjected to prolonged spinal injection of diarsenolized serum (Swift-Ellis technic) at slowly increasing pressure, with the hope of forcing the serum not only into the cranial cavity but back into the lymph channels of the brain and into the brain substance itself as was the case in the experimental animal. That the first of these requirements was satisfied was assured in two patients in whom craniotomies had been performed, in that *serous fluid, evidently dilutions of the serum injected into the spine, was obtained from the subarachnoid space over the frontal lobes.* Whether the second requirement be fulfilled we can only guess at present; the outcome of treatment as it affects the symptoms and laboratory findings being our index.

The technic employed is as follows: The patient is placed on his stomach, with back arched by a pillow, and lumbar puncture performed. After noting the spinal fluid pressure, all the fluid which will come without suction is taken, the head is then lowered and diarsenolized serum full strength, 20 to 30 c.c. is allowed to run in, and is quickly followed by normal saline. As more saline is given the pressure is found to

gradually increase, but if no attempt at haste is allowed, 150 c.c. or more of fluid may be given without discomfort to the patient or alarming symptoms of any kind. The four injections so far given may be tabulated as follows:

Sp. fl. press., before	Fluid injected	Time taken	Sp. fl. press., after
* I. 150 mm.	70 c.c. (20 c.c. serum)	45 min.	450 mm.
II. 150 mm.	170 c.c. (25 c.c. serum)	60 min.	550 mm.
III. 190 mm.	100 c.c. (27 c.c. serum)	40 min.	530 mm.
* IV. 190 mm.	100 c.c. (30 c.c. serum)	165 min.	460 mm.

* After these injections, serum was obtained by puncture of the cranial space over the frontal pole.

It is calculated that the total amount of cerebro-spinal fluid in the body is about 150 c.c. We may, then, conceivably replace this fluid by a spinal injection, though bearing in mind the certainty that some of our injection is constantly being carried away during the process. Nevertheless, some reaches the brain, as clearly shown by our obtaining the same over the frontal lobes, and being obtained at this distant point we may assume that the base is washed by an even greater quantity of serum.

It seems to the writer that the above method of injection of serum, given *under high pressure for a long period of time*, offers a means of cranial lavage most likely to cause penetration into the brain tissue, and to be much easier of repetition than the various forms of direct intracranial administration. Whether or not the procedure is of value is not the subject of this paper.

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Medical Progress.

TENTH REPORT OF PROGRESS IN ORTHOPÆDIC SURGERY.*

By ROBERT B. OSGOOD, M.D., ROBERT SOUTTER, M.D.,
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TUBERCULOSIS.

Heliotherapy.

THE entire fifty-first number of the *Korrespondenzblatt* is given up to a discussion of the results to be expected from heliotherapy. Rollier¹ of Leysin, its most active advocate, seems to be quite as enthusiastic as ever, reporting in 198 cases of vertebral caries 171 cured and 18 improved; in 158 cases of hip disease, 125 cured and function restored in 102; in 120 knee cases, 106 cured and 78 with function. He has established a labor colony for the learning of trades, such as wicker work, and a farm colony where the convalescent patients are taught the care of bees and stock and the cultivation of vegetables and flowers. He urges that such institutions be established by the state in connection with heliotherapeutic institutions. He believes that the mountains offer the best climatic conditions.

Schäffer² reports that at the Vegelgard Sanitarium in Denmark, sun baths were introduced into the routine treatment of bone and lung tuberculosis as long ago as 1902. Three hundred and sixty-four patients have been given systematic heliotherapy, with gradually increasing exposures up to one hour. No bad effects were noticed except an occasional erythema. These were apparently all lung cases, but no marked improvement was noticed in the majority. Several cases suffering from long standing infections were greatly benefited. The Sanitarium has now introduced artificial "heliotherapy."

Schrotter,³ another advocate, believes that the length of time of exposure is more important than the intensity of the radiation and that the "cure" can be successfully accomplished at medium altitude and even sea level. In fact, he considers that the climate of the high mountains is often too severe for weakened organisms.

Becker⁴ reports on heliotherapy in surgical tuberculosis as carried out in Teheran, where the sun shines for seven months. On account of the intense heat, only the affected parts were exposed. Fifteen of the twenty-five cases progressed to complete cure while under observation.

Kirsch and Gratz⁵ have observed that under heliotherapeutic treatment old sinuses begin to heal very rapidly. New sinuses frequently form, but discharge only serous fluid and only for a short time. Pain is greatly relieved.

Hinsdale⁶ has reviewed the history of heliotherapy and declares that Madame Duhamel in

1857 brought scrofulous children to the beach in France, bathed their sores in salt water and exposed their naked bodies to the sun.

(Ed. Note.—As we have said before in other Reports of Progress, heliotherapy is a method of treatment which we must employ. Rollier seems to us to have perhaps unnecessarily and unwisely abandoned all operative and certain fixative aids to treatment. Many roads lead to Rome, and the longest way round is by no means always the shortest way home, but the striking fact remains that satisfactory results may be obtained by this method alone in a large number of cases, and while we ought not to give up older and well tested methods of cure, we must be sure that this gift of the gods is utilized.)

Strohmayer⁷ in 120 cases treated with Roentgen rays considers the results very satisfactory, particularly from a functional point of view. In fact, he believes that resections will become unnecessary in most cases. He has seen no harm come from the use of the rays.

Oehler⁸ also recommends x-ray therapy in surgical tuberculosis, believing that the effect on the smaller joints and more superficial bones is much more favorable than on the deeper ones. He used lightly filtered rays.

Beck⁹ has continued his studies with Rosenbach's tuberculin in 45 more cases of tuberculosis, 11 of which were of bone tuberculosis. He is still most favorably impressed by the reduction of the swelling, the closing of the sinuses, and the returning mobility. Hackenbruch¹⁰ believes that the local injections have a more favorable influence than the intravenous. He reports an autopsy on a case apparently cured after several injections, showing no evidence of active tuberculous disease. Of the 81 cases injected, four died. For treatment he recommends monthly intervals between injections. For diagnostic purposes it should be given cautiously and with gradually increasing doses.

Haas¹¹ has carried out very exact experiments in order to discover whether or not tubercle bacilli are constant inhabitants of the blood of patients suffering with surgical tuberculosis. In eleven out of 24 cases, acid-fixed bacilli were found to be in the blood, but were not recognized as tubercle bacilli. The animal experiments were all negative. Haas does not deny that sometimes tubercle bacilli may be found in the blood, but does not believe that such findings should be of any value in regard to the prognosis.

Caries of the Spine.

Janssen¹² in an article on the early diagnosis of tuberculosis of the vertebrae, states that the most important early symptoms are (1) pain after standing; (2) disagreeable sensations in the back, which may be noticed especially in sitting at the table. He believes that any complaint of back pain in individuals who have pre-

* This report is based on a review of 440 articles selected from about 900 titles having to do with orthopedic surgery, appearing between Nov. 1, 1914 and Jan. 1, 1916. References are given to only such articles as have been selected for note and comment.

viously recovered from pulmonary disease, should be most carefully investigated. He speaks also of the girdle and ilio-inguinal pain of the more advanced stages. Recumbency and heliotherapy with a Hessing corset for a year after apparent cure are his methods of treatment.

Wierzejewski¹³ has employed a method of bone grafting in Pott's disease similar to that of Henle and Brackett, using two splints of bone, one on each side of the denuded spinous processes. He avoids thus the trauma of splitting the spinous processes, which he considers likely to favor the further involvement of the vertebral body with disease, and to be very dangerous to the spinal cord if the arches of the vertebrae should be affected. In the early cases he considers Albee's method to be free from danger. He uses the motor saw and believes he thus avoids the danger of fat embolism.

Hip Disease.

Allison¹⁴ reports 25 cases for consideration as to whether a traction splint or a plaster of Paris cast is the better method. He discusses also whether the best result is ankylosis or motion. He believes it is essential to protect the hip from both weight-bearing and motion in the acute stages, and that this can probably be done only in a plaster cast, high sole, and crutches. During the convalescent stage Allison believes that a traction splint is most satisfactory. He does not think that ankylosis is the best result, and does not agree with Lorenz that the weight-bearing treatment to bring about firm ankylosis is the best method of treatment. He thinks that traction does not materially increase the amount of atrophy, and that it does preserve a certain amount of motion. In those cases treated by an abduction splint a certain amount of motion remained, but in over one-half the cases treated with a plaster of Paris spica, the hip was fixed. The form of treatment had apparently no influence on the development of abscesses. Allison does not state definitely the amount of motion in his cases, or whether in those cases with little motion there developed, perhaps many years afterwards, such painful symptoms as made it necessary to fix the joint by arthrodesis.

(Ed. Note.—There will probably always be found honest differences of opinion as to what constitutes the best functional result in tuberculous coxitis, ankylosis in a good weight-bearing position or varying degrees of motion. It is certainly true that the majority of cases do not obtain anything like normal range in a true tubercular hip disease, but occasionally we see undoubted cases in which the eventual range is so considerable as to be more desirable functionally than complete ankylosis. All of the editors in the light of their clinical experience would prefer, if they themselves or their children had early tubercular disease of the hip joint, to have that treatment administered which would favor eventual motion. All of the editors, if extensive destructive changes were evident, would prefer to have that treatment administered

which would lead to firm ankylosis in a good weight-bearing position. It is fair to take into consideration also that if this more or less mobile hip should be easily strained or show signs of recurrence of this almost malignant disease, an arthrodesis could probably be successfully done later.)

Tuberculosis of the Knee.

Sever and Fiske¹⁵ have reviewed the results in 638 patients treated at the Children's Hospital in Boston from 1880 to 1910. In 30% there was a history of trauma, in 14% there was a family history of tuberculosis, in 27% abscesses occurred. They found bone involvement most common, but synovial disease not rare. The average duration of treatment was four years and nine months; in the unoperated cases, four years and two months, and in the operated cases, five years and eight months. Considering ankylosis in a good position for function, and cure with motion as good results, there were 65% of satisfactory results and 35% unsatisfactory.

Rogers,¹⁶ in a series of cases of tuberculosis of the knee in adults, finds best results from operative treatment, and believes that a diagnosis can often be made only by exploratory incision and examination of the joint. He believes that primary synovial disease is common.

Ely,¹⁷ reporting an excellent result of a case of astragalectomy for tuberculosis of the tarsus in a man 25 years old, makes a plea for this trial rather than amputation or extensive resection in disease of the tarsus. He is convinced that conservative treatment is usually unsatisfactory, the intimacy of the various joints making the spread of the disease throughout the tarsus possible. Ely believes that if the joint is destroyed the disease will in time disappear, the bone marrow structure at the site of the operation is changed, the synovial membrane disappears, and tuberculosis can no longer flourish in that locality, though encapsulated tuberculous nodules may persist for years without causing the slightest trouble. "No joint, no lymphoid marrow, and no synovial membrane. No lymphoid marrow and no synovial membrane, no joint tuberculosis. Conclusion.—To cure joint tuberculosis in the adult, destroy the joint!"

ARTHRITIS.

Nordmann,¹⁸ writing on gonorrheal arthritis, says that he has found no drugs which will offer any material relief. He has found that passive hyperaemia, on the contrary, affords great ease from pain and improves the objective symptoms. It should be employed, he thinks, for twenty out of twenty-four hours, and never tight enough to make the limb below look bluish. Fixation in plaster also relieves the pain in the majority of cases, but may easily be left on too long and result in an ankylosis, one of the most difficult forms to treat. Traction as a last resort is often helpful.

(Ed. Note.—The editors have had the same

experience as Nordmann with passive hyperaemia in gonorrhoeal arthritis. Its pain-relieving action is most satisfactory, and, as Nordmann says, the patients often dislike to have it taken off even for a few hours. We believe a word of caution should be said concerning the great danger of too long continuance of fixation or of any expectant treatment. If the acute condition with high temperature, effusion, and great sensitiveness continues with unabated severity after a trial of one or two weeks of fixation, passive hyperaemia, etc., we advise a small opening into the joint and a thorough washing out with hot (112° F) saline solution or a mild antiseptic and a subsequent immediate tight closure of the capsule. When the gonococci invade the capsule, as they are said to do frequently in the third or fourth week, arthroplasty is the only measure likely to restore normal or painless motion, and even this operation of problematical success must be deferred for many months. The early washing out of the joint may be expected to result in a rapid recovery. We must also remember that in all gonorrhoeal infection the source of the poison must be eradicated. No more remarkable results have been reported than the cures of old and acute joints which have taken place after the drainage of the prostate or the removal of the seminal vesicles.)

Riche¹⁹ has noted that good results in cases of nonarticular gonorrhoeal arthritis follow the intravenous injection of "arthigon." Improvement was noticed even in old negative cases. There was prompt relief of pain.

Mulzer²⁰ also has been impressed with the benefit following the use of "arthigon" in gonorrhoeal arthritis, but thinks the intragluteal injections safer than the intravenous, which he feels give too strong a reaction. He does not fix the joints.

(Ed. Note.—Arthigon is a gonococcic vaccine representing an aqueous solution of carefully killed gonococci, made after certain experimental work by Dr. Bruck at Prof. Neisser's Clinic in Breslau. [Schering.])

Netter and Durand²¹ have found a suppurative joint trouble a comparatively frequent complication of cerebrospinal meningitis, second in frequency only to otitis media. It has always terminated favorably in every case, but recovery seemed to be hastened by injection of anti-meningococcus serum directly in the joint. In the last seven years this suppurative arthritis was encountered in eleven of their 200 cases of cerebrospinal meningitis. Various joints were affected, sometimes several at one time. In five cases no microbes could be cultivated from the joint or revealed by the microscope. In this group the arthritis developed later than in the others. In one infant of ten months, meningococci were found in the joints of the foot while the meningitis was at its height. As this meningitis subsided under intraspinal serotherapy, the toe processes subsided also, but subsequently pus accumulated in one ankle. No meningococci

could be cultivated from it, however, and the suppurative process promptly disappeared with a single injection of antimeningococcus serum. In one child one year old, there were eleven separate suppurative processes. In four infants the suppurative processes were in fingers and toes. In two of these purpura was the first sign of anything wrong. The age of the patients ranged from ten months to thirty years. The meningitis terminated fatally in four cases. In addition to the above eleven cases they report the death of a three-months' babe from a primary meningococcus arthritis in the shoulder. The meningi were apparently normal. This meningococcus arthritis resembles very much the primary or secondary arthritis set up by pneumococci. They both are more benign than joint trouble of other origin, but the meningococcus affection has the advantage of having available a specific medication, namely, direct local injection of anti-meningococcus serum. The knee is the joint usually affected, according to Sainton and Maille,²² who have encountered three cases in the course of well-defined cerebrospinal meningitis and know of seven other cases in a total of 63 cases of the disease. The proportion was thus 15.8%. In addition to the above, they report two cases of arthritis in which the knee trouble was the first sign of the meningococcus infection to attract attention. In both there was first an infectious sore throat, then headache and insomnia, and finally the characteristic arthritis with meningococci in the purulent fluid obtained by puncture. Any arthritis in the course of an epidemic of meningitis should at once arouse suspicion. The meningococcus seems to be capable of generating an actual acute infectious pseudorheumatism.

Strauss,²³ reporting a case, believes that both the so-called Still's disease and Mikulicz's disease are very closely related and are probably due to general chronic infections. In most of the cases he expects to find chronic indurative inflammations of the parotid or submaxillary glands as well as chronic pharyngitis.

Boorstein,²⁴ in an article on what he terms chronic progressive polyarthritis, discusses the etiology. He is rather inclusive, believing that the onset may be favored by occupation, worry and disturbance of metabolism due to irregularities in the gastro-intestinal tract or the ductless glands. He considers also that the specific cause may be the subacute infections, such as an abscess at the base of a tooth, a tonsil, or a disordered prostate or tube. He is somewhat optimistic in his prognosis, though he regrets the fact that the focus is sought often too late for complete return to normal conditions, the local joint changes having become too permanent. He emphasizes the importance of avoiding routine and instituting a regimen applicable to the individual. Eradication of the focus, correction of the visceroposis by posture, diet, and local treatment consisting of combinations of rest and

exercise, he believes will result in the betterment of most cases.

Davis²⁵ reviews the usual methods of local treatment of painful, non-tuberculous joints, such as baking, massage, passive motion and fixation, which latter measure he considers is usually inefficient. He believes in absolute fixation, and since there is no generally accepted method of therapy he urges that absolute fixation be given a thorough trial, as a routine in the treatment of painful chronic arthritic conditions.

(Ed. Note.—The author does not discuss the different types of painful chronic arthritis, and if he means to include all the types we must dissent from his views. We agree that absolute fixation will often most quickly and most permanently relieve the chronic hypertrophic, or degenerative or osteoarthritic, type, using these terms synonymously. We do not believe that absolute fixation is indicated in the chronic infectious or atrophic types. In our opinion a combination of partial fixation, only enough, in fact, to relieve pain, and massage, exercise, and hyperaemic measures in general are indicated in both these latter types. We should strive rather in these to prevent adhesions and discourage atrophy. Absolute fixation would seem to encourage both these undesirable tendencies. Painter,²⁶ in an article on the treatment of the convalescent stage of infectious and atrophic arthritis, admirably expresses our convictions on this subject. He says that the first response to an invasion of any joint by bacteria or their products is the reaction in the synovial membranes, modified in its intensity by the virulence of the infectious agent and the response of the local tissues. A definite trauma or occupational irritation must be considered a factor in determining the beginning and extent of the trouble. These inflammatory reactions consist in the engorgement of the local vessels with blood. The effusion of a certain amount of serum and the infiltration of the sub-serous tissue with small round cells, and later the proliferation of connective tissue in response to the toxic irritation. If the invading organism is of a virulent character, there will be much effusion; in a mild type there will be less effusion and more villous hypertrophy. As a result of the effusion there is a tendency to contractures and muscle spasm. Serous surfaces may become eroded and the sub-serous tissues exposed to irritation. In the less virulent infections, where there is no immediate erosion of the serous surfaces, the deformity, which at first is due to muscular spasm, tends to become permanent because of the proliferation of the synovial membrane, which often projects its folds between the joint surfaces and mechanically obstructs the extension. Painter has observed that the earlier and more persistently the patient compelled himself to use certain joints, the more motion they will possess; for instance, the right arm and hand showed a better function, also the thumb and index finger.

The selection of the time to begin motion without running the risk of stirring up the activity of pathological processes is hard to make, but when there is a small arc of motion present, however small it may be, it is desirable to use the joints passively, always trying to increase that motion gradually. Prolonged fixation often does more serious harm than causing adhesions; the function of the joint is necessary for the proper metabolism and nutrition of its tissues.)

Brackett's²⁷ conclusions as to the operative treatment of "osteoarthritis" of the hip are based on a wide experience. He believes that operation is applicable in cases only where the disease is localized and monoarticular, and where it is the remnant of an arrested process. He considers first the localized hypertrophic overgrowths in joints not permanently damaged, and recommends an anterior or antero-lateral incision, through which a large part of the rim of the head of the acetabulum can be explored, and removed if necessary. In purely osteoarthritic cases where there are extensive overgrowths resulting in enlargement of the whole joint structure, there are two operations of choice. (1) Excision of the head of the femur, leaving the acetabulum intact, hoping to gain some motion and relieve the pain. (2) Complete arthrodesis, trying for complete fixation, so that we may make a firm weight-bearing joint. In operating greatest care must be taken to preserve the Y ligament. The most important element in the decision for an operation is the relief of pain, as it is often the chief cause of the disability. The judgment of the value of the operation may often be a success in the relief of this element. It is generally very encouraging to relieve these distressing symptoms, and the relief is most often permanent.

Daniels and McCrudden²⁸ have tried to determine whether there is any relation between the attacks of gout and the amount of uric acid in the blood, or between such attacks and the amount of uric acid excreted in twenty-four hours. Two cases were very thoroughly studied, and gave typical histories of gout with characteristic x-ray pictures and general symptoms. As far as one can judge from the very careful clinical examination they were cases of true gout, and not atrophic or infectious arthritis. The patients were kept on a practically constant purin-free diet. The authors found no more uric acid in the blood than in normal individuals, and the amount of uric acid in the blood was not altered during the acute attacks with gouty symptoms. Attacks of gout appeared during the administration of atophan, when, as is shown by chemical analysis, the uric acid content of the blood had been greatly decreased. Many observers have found much advantage in the use of atophan in preventing the severe attacks of gout, and the relative increase in uric acid in the blood has been shown to be present in individuals under normal diet, either previous to or during the

acute attacks of gout. It is true, however, that as yet our methods of careful quantitative examination⁹ of the amount of uric acid in the blood are not fully reliable. They admit that there seems to be some definite causative relation between the presence of the uric acid and the severity of the symptoms.

The Occurrence of Arthritis in the Field.

Chaput,²⁹ striving to better the treatment of the distressing and serious cases of purulent arthritis resulting frequently from bullet and shell wounds, discusses the appropriate treatment for each of the large joints, describing the special syndrome and the indications for operative intervention and the various steps if intervention is determined upon.

(Ed. Note.—The impression which we have gained from an experience with these wounds leads us to advise conservatism rather than radicalism in their treatment. We are accustomed to think of the joint surfaces as very susceptible to infection and we know, of course, the dire consequences which often follow severe infections of joints. Cotton³⁰ has recently suggested, as did Goldthwait many years ago, that possibly we have underrated the resistance of joint tissues to even very considerable infections. His series of cases show almost constantly good results from a thorough, prolonged washing out of the infected joint with weak antiseptic solution through comparatively small linear incisions, and the sewing up tight of the joint capsule, leaving a small drain through the periarticular tissues and skin. Many cases which we have observed of infected joints caused by bullet or shell wounds, provided the infection had not existed for too long a time, progressed to a complete recovery after a thorough washing out and a cleaning of the adjacent tissue, with only a small rubber tissue wick for drainage left down to the joint-opening and removed in a few days. Joints drained more radically and for a longer period nearly all become stiff. Joint motion is a stake well worth playing for and the risk of life or even of amputation is not a serious one with careful watching.)

Both Schmidt³¹ and Freund³² have observed numerous cases of arthritis, myalgia, neuralgia, etc., among soldiers. Both of them in many cases found either present foci of infection or histories of similar attacks of which these were exacerbations. Freund has seen some cases of true neuritis even with paralysis, disturbances of sensation and nutrition. Freund has also observed many cases exhibiting a fairly constant symptom complex. This consists of severe tenderness of the muscles and periosteum, marked over their insertions and over the joints. The lower extremities are most commonly affected, especially the tibia. There are never any signs of an exudative or infiltrative process. Spontaneous pains are common. The motion is often limited and the tendons feel too short. The gait is typical. The general health did not seem to be affected and the temperature was normal.

The course was chronic and there was no improvement under salicylates. All these patients had been exposed to wet and cold and in some of the cases congelations of the first, second, and third degree were present. Freund does not explain the condition from a pathological or anatomical point of view, but believes that probably the motor apparatus had been damaged by the cold.

Michelsen³³ and Nieber³⁴ each report one case and Brandes³⁵ reports ten cases of juvenile deforming osteochondritis of the hip joint, with Roentgen ray findings. All the authors reach about the same conclusions as to the nature of this usually benign disease. Brandes suggests that the cases of supposed tuberculous hip joint disease with recovery may have represented this type of trouble. He reports that a "walking" plaster cast applied for two to seven months may materially improve the condition.

Heineck³⁶ contributes a valuable review and analysis of all the English, French, and German reported cases of joint bodies (mice) found in articulations otherwise normal. Of the 303 cases, 262 were males, 250 were of the knee joint, and 41 of the elbow. The symptoms were pain, tenderness, effusion, disability (crepitus?), and locking. He considers operation and removal of the foreign body to be the only rational and radical method of dealing with the situation.

Moschowitz³⁷ attempts to explain the pathology of the calcification of the supra- and infra-spinatus tendons in certain cases of subacromial bursitis, but fails to some extent in the attempt. He offers no satisfactory explanation.

(Ed. Note.—We have been much surprised to find how frequently these apparent lime deposits in the floor of the bursa disappear without known cause, and often in a few weeks or months. The nature of these is not quite clear, but it would seem as if they did not require quite as grave a prognosis as we had been giving them.)

Brickner³⁸ believes that it is difficult to demonstrate, in the Roentgen ray, thickening in the subacromial bursa. He considers that most lesions of this bursa are not a result of a toxic inflammation but probably due to traumatism between the acromion and the greater tuberosity. Operation he considers unnecessary except in old long-standing cases that nothing else relieves.

(Ed. Note.—While trauma may well be an essential factor in many cases, we are quite certain that subacromial bursitis occurs without discoverable trauma and as a concomitant or as a sequela of infections. We agree with Brickner that operation is not usually necessary except in old long-standing cases.)

PARALYSIS, CEREBRAL. POLIOMYELITIS.

Mayer³⁹ emphasizes the importance of orthopaedic treatment and mechanotherapy after a

cerebral hemiplegia. The deformities should not be allowed to persist.

(Ed. Note.—Our experience leads us to urge with Mayer that more attention be paid to these conditions. Much can be done by muscle training and stretchings and occasionally by operations and apparatus to correct the distressing deformities. It is by no means certain that other attacks will occur. Often these patients live many years without any recurrence, active in mind and capable, with help, of being active in body as well.)

Bartow⁴⁰ is still enthusiastic over the use of his intra-articular silk ligaments in the reënforcement of paralytic flail joints. About 150 cases are reported.

Gallie⁴¹ reports his observations on 100 cases of tendon fixation which had been operated upon by the methods he has described and which have been discussed in previous "Reports of Progress." He considers the operation most applicable to cases resulting from paralyzes of the peronei and to cases of calcaneus resulting from paralysis of the calf muscles. If it is uncertain whether a muscle is completely and permanently paralyzed and there is a chance for at least a partial recovery, Gallie buries only one-half of the tendon in his bone groove, and sewing up the sheath around the other half allows it to functionate if it will. All of the 100 cases healed by primary union and all but two have been decidedly improved. These two cases improved after a second operation. The author believes that this operation should be considered in a great many cases where arthrodesis has been suggested.

Marshall and Osgood⁴² were able to obtain the end-results of some 26 operations performed by different orthopaedic surgeons at the Massachusetts General Hospital for the correction of foot deformities resulting from poliomyelitis. No case operated upon less than two years previously was included and most of the cases were adults. The results of seven astragalectomies with displacement of the foot backward were excellent in four cases and bad in only one. Arthrodesis was successful in three cases. The tendon lengthenings and stretchings all showed good results. The tendon transplantations showed better results than the authors expected to find. There was no evidence in their series of over correction of the deformity. The weakest point in the treatment seemed to be the after care, which was often neglected. Considering the fact that different surgeons operated upon these cases and that many of the patients were unable to carry out after treatment, they consider the results in this small series justify the operative procedures.

(Ed. Note.—The editors from their clinical experience believe that in paralytic flail feet the operation of arthrodesis cannot be depended upon, especially in children, to give a good functional result, whereas from astragalectomy (Whitman), with displacement of the foot back-

ward, excellent functional results, including lateral stability, may be expected.)

RICKETS. SECONDARY HYPERTROPHIC OSTEO-ARTHROPATHY. OSTEITIS DEFORMANS.

Schloss and Frank⁴³ have made many (six) contributions to the literature of rickets, dealing chiefly with methods of treatment. They strongly advocate the use of cod liver oil and calcium phosphate, and the experiments described in the article which we are reporting were designed to demonstrate that the good effects obtained, tended to be permanent. There were 78 of these experiments, and the results of treatment were determined by a study of the metabolism. They conclude that this medication in both the early and the late stages brings about marked improvement in the calcium and phosphorus balance and maintains its efficiency over long periods. Clinically the bones become harder. The prescription which they employ calls for 10 gm. calcii phosphoric. tribasic puriss. in 100 gm. ol. jecor. assell. The dose is 5 mg. twice a day, shaking the bottle before using.

Locke⁴⁴ from his observation of a series of cases extending over many years and from a complete review of the literature, concludes that while the processes underlying simple club fingers and the changes in the terminal phalanges in the cases of the so-called pulmonary arthropathy may vary, the changes in the fingers themselves are the same, differing only in degree. Locke believes that these clubbed fingers indicate some disturbance in metabolism caused by a pathological process.

Gaenslen⁴⁵ believes that focal infections, *e.g.*, teeth, may be the cause of the changes in osteitis deformans. Among 65 cases reported in the literature Gaenslen finds a frequent history of rheumatism and many chronic focal infections, 11 times in the teeth. In one case which he studied very carefully and in which he was led to believe the teeth were the most important factor, he administered "emetin" for ten days, with great relief of the symptoms.

OSTEOMYELITIS AND SYPHILIS.

Clopton⁴⁶ advocates radical treatment and thorough drainage in cases of osteomyelitis. He deprecates the use of gauze wicks and advises rubber tubes or rubber tissue. When sequestra have been removed he does not believe in curetting or the use of too strong antiseptics. In the very chronic localized cavities where all the bone detritus can be removed he believes that bone wax is especially valuable. He thinks this is probably a better method than allowing a blood clot to form.

Simmons⁴⁷ has analyzed 82 cases of the acute type of osteomyelitis and finds that 70% are in persons under fifteen years of age. If the diagnosis is made at once and the bone operated upon immediately the outlook is good. When in the child there is recurrence of pain in a limb and a general toxæmia, osteomyelitis should always be suspected and an early operation per-

formed even if the symptoms are rather vague. The danger of the operation, even if a wrong diagnosis has been made, is less than the danger of waiting in a suspected case. In the chronic cases with bone abscess Simmons believes in a very radical operation. This belief is held also by Ochsner,⁴⁸ who, while not going so far as Nichols⁴⁹ and removing the entire shaft, thinks that multiple sinuses and generally poor results are obtained where there is little bone removed and free drainage is not established. He urges radical and extensive removal of the chronically diseased bone.

Syphilis.

Nichols⁴⁹ has reached the conclusion that as a method of diagnosis in syphilis of the bones, the Roentgen ray is usually reliable. The congenital lesions are periosteal overgrowths or endosteal gummata, and they appear usually near the epiphyseal line.

Cofield⁵⁰ maintains that all cases of chronic synovial effusion not yielding to usual treatment should arouse suspicion of luetic disease. The cases of simple arthralgia with or without a slight effusion are also suspicious and the blood tests should be made. A more definite group in which the lesions are tertiary includes those cases in which small gummata may be present in the synovial membrane near the points of ligamentous attachment. Ulceration and thickening of the capsule are later stages. Cofield believes that it is only a step from this gummatous involvement to the osteoarthropathy of a Charcot's joint. In the congenital cases he has been disappointed in the use of salvarsan, but obtained good results from the use of mercury and the iodides.

(Ed. Note.—Various articles have appeared in the last few years written by careful observers and maintaining that in their respective clinics the percentage of luetic joint cases was very high. After each of these reports we have sought to confirm these findings in our own clinics, but while occasional unsuspected cases have been proved to be luetic and an occasional diagnosis of tuberculosis has been changed to syphilis, we think it is fair to say that no very large number of syphilitic joint lesions have been discovered. Perhaps our observation has been faulty; perhaps also this community is fortunate in having a low percentage of lues, but we should certainly be very sure of our data before making this diagnosis, which rightly or wrongly carries with it a stigma capable of producing great unhappiness and distress to the patient, to say nothing of inefficient treatment if perchance the condition is after all tuberculosis and not syphilis.)

(To be continued.)

Book Reviews.

A Text-Book of Physiology for Medical Students and Physicians. By WILLIAM H. HOW-

ELL, Ph.D., M.D., Professor of Physiology, Johns Hopkins University, Baltimore. Sixth edition thoroughly revised. Octavo of 1043 pages, 305 illustrations. Philadelphia and London: W. B. Saunders Company. 1915.

The two years that have elapsed since the fifth edition of this admirable text-book appeared have been years of great activity in physiological laboratories, and a large body of observations of more or less importance has accumulated. The point of view of those who attempt to interpret physiology must be adjusted constantly with reference to new facts as they appear. In the case of a science like physiology which has a fundamental relationship to medicine, it is of utmost importance that new facts and new interpretations be made available for teachers and students as early as possible. Herein lies the justification for the frequent revisions of text-books of physiology for medical students.

The new edition of Howell reports the significant new facts and reflects accurately the important changes of interpretation of the past two years. In minor points, also, care has been taken to include the most recent information. Specially worthy of note are the sections on the energetics of muscular contraction; on nutrition; and on the ductless glands; each of which has been largely rewritten, with the result that they are even more satisfactorily handled than in the excellent treatments of the same subjects in previous editions. The book well merits the commanding place it has attained in medical teaching in America.

The American Illustrated Medical Dictionary.

A new and Complete Dictionary of the terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Science, Biology and Medical Biography, with the Pronunciation, Derivation and Definition, including much Collateral Information of an Encyclopedic Character. By W. A. NEWMAN DORLAND, A.M., M.D., F.A.C.S. Eighth edition, revised and enlarged. Philadelphia and London: W. B. Saunders Co. 1915.

The seventh edition of this standard American medical dictionary was reviewed in the issue of the JOURNAL for May 14, 1914, (Vol. clxx. p. 766.) This eighth edition has been thoroughly revised, with the addition of several hundred new terms and the increase of the text matter from 1107 to 1137 pages. The material added includes a large number of new tests with new and elaborate tables of the arteries, muscles, nerves, veins, bacteria, ptomaines, leucomaines, weights and measures, diseases, operations, signs and symptoms, stains and methods of treatment. The illustrations are excellent and include several full page colored plates. The editor is to be commended for retaining the Greek characters in the descriptive etymology of words.

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THE WORKMEN'S COMPENSATION ACT.

A NEW PHASE.

A RECENT decision of the Massachusetts Supreme Court of interest to the medical profession, is recorded in another column. A workman, named Jerry Pecott, in the Arlington Mills, Lawrence, developed a hernia, because of heavy lifting, shortly before closing time on Saturday, October 31, 1914. Disregarding the signs displayed in the room where he was employed, setting forth that two physicians were engaged to attend injured employees and that the bills of no other physicians would be paid, and stating later that he did not know of these rules, Pecott went home and sent for his own physician, being in considerable pain. The following Monday he tried to telephone to his foreman in the mill, but was unsuccessful in talking with him. He, however, left word at the mill office that he had received an injury and was going to be operated on, by the advice of his

physician, who feared strangulation of the hernia. On the succeeding Wednesday the operation was performed by his doctor successfully, and in the course of time a bill for \$65 was rendered. As the insurance company which insured the mill disputed the bill, the matter was referred to a committee of arbitration, which reduced the bill to \$50, the customary schedule fee for such operations, and ordered the bill paid. The Industrial Accident Board unanimously affirmed the decision of the committee, taking the ground that under the terms of the compensation act there was a justifiable cause for the injured employee calling his own physician to treat him for an acute, painful and dangerous condition; that the mill being shut down on Saturday afternoon, he could not communicate with the authorities, and furthermore, he did not know that skilful physicians were provided by the mill to give necessary treatment; therefore the insurance company should pay the doctor's bill.

The insurance company appealed from this decision to the Supreme Court, which reversed the decree of the Accident Board because the court held that the employee, who could read, should have known of the import of the signs in the mill; that he made no effort to secure the services of the mill physicians; that the right to select the attending physician is given to the insurance company by the statute, and the court thought that the legislature, in passing the act, did not intend to give the employee the privilege or right of selecting his own physician at the expense of the insurer, and that, under the amendment of the act, passed in 1914, where a physician other than the one provided is called in a case of emergency, or for other justifiable cause, and the insurer is required to pay for his services, the evidence had not shown that in Pecott's case there was an emergency or that any cause had been shown that would justify a reasonable man in neglecting to seek the services of one of the physicians named by the mill.

Therefore it was for the employee or for no one to pay the doctor's bill in this case. The quality of the service or the competency of the physicians did not come in question, as all three were Fellows of the Massachusetts Medical Society, and the result of the operation was satisfactory. The court decision will have the result of making independent physicians cautious about rendering similar service to employees of corporations which carry this sort of insurance.

MASSACHUSETTS MILK LEGISLATION.

THE perennial subject of milk legislation in Massachusetts is now again before the General Court and the medical profession for consideration. For a number of years attempts to settle satisfactorily the problem of the production, transportation and distribution of a safe and reliable milk supply have been made in the legislature and a series of bills aiming to accomplish this end have been discussed editorially in the JOURNAL. For various reasons all these measures have successively failed of enactment, and the control of the milk situation in Massachusetts, though by no means seriously at fault, has continued unsatisfactory.

The latest of these abortive legislative attempts to regulate the milk supply was the so-called labor clean milk bill, whose passage was strongly advocated last year by the JOURNAL and by the Massachusetts Medical Society. This bill, whose text was published in the issue of the JOURNAL for February 25, 1915 (Vol. clxxii, p. 308), was passed by the General Court, but was unfortunately and unwarrantedly vetoed by the Governor, presumably for political reasons. On May 21, 1915, this veto was sustained in the Senate by an almost strictly party vote. Governor Walsh's veto message was published in part in the issue of the JOURNAL for May 27, 1915 (Vol. clxxii, p. 799), and in the same issue of the JOURNAL (p. 794) we commented editorially upon this unfortunate catastrophe to a piece of excellent legislation that had been almost brought to fruition.

Following this latest failure to secure the legislative authorization necessary to enable it adequately to control the milk situation, the Massachusetts State Department of Health appointed a milk board consisting of Dr. Eugene R. Kelley, director of the division of communicable diseases; Mr. Herman C. Lythgoe, director of the division of food and drugs; Mr. Edward H. Williams, of the engineering division; and Dr. J. E. Lamoureux, of the public health council. After an eight months' investigation of the entire subject, this board presented, in February, 1916, an extensive report, the conclusions of which are published in another column of this issue of the JOURNAL. Upon this report has been based a new bill, relative to the inspection of milk, drafted at a conference consisting of the legislative committee of the Massachusetts Association of Boards of Health, representatives of the local

boards of health and representatives of the Massachusetts State Department of Health. This new bill, whose text is also published in full in another column of this issue of the JOURNAL, has the approval of the committee of the State Grange, and is now submitted to the legislature by the State Department of Health as a substitute for another bill which it had previously submitted earlier in the season.

The report of the Massachusetts Milk Board above referred to pointed out that the present statutes dealing with the milk problem have resulted in an over-lapping and at times contradictory system of dairy inspection by state and local authorities, with the result that dairymen and milk dealers have been subjected simultaneously to conflicting regulations. The Boston Health Department has felt that Boston is unjustly obliged to carry on the dairy inspections for many other cities and towns in the metropolitan district. On the whole, the milk board believes that the sanitary condition of dairies in Massachusetts is satisfactory, but that the condition of dairies in Maine, New Hampshire and Vermont is somewhat below that standard. As a matter of fact, only 43% of the inhabitants of Massachusetts have an adequate protection of their milk supply, and about 20% of the total population now receives no milk protection from local boards of health. The Massachusetts Milk Board regards the New York system of grading milk as highly satisfactory, and believes that its introduction in some form into Massachusetts would be beneficial.

The present bill, favored by the Massachusetts State Department of Health, based on the report of the milk board, aims to centralize the sanitary supervision of milk in the hands of the state health department, laying more emphasis on inspection of the product itself than on the premises where it is produced. It provides uniform rules and regulations relative to the production, pasteurization and distribution of milk, but does not prevent local boards of health from making further regulations of their own.

In a statement issued in connection with the filing of the bill, the Massachusetts State Department of Health comments upon it as follows:

"The bill provides that milk dealers must annually, on and after June 1, 1917, obtain a permit from the State Department of Health, the permit to be issued after an inspection of the premises of the dealer and, if desired, of the different producers, but, in addition, an inspec-

tion must be made of the milk intended for sale. It is intended, in contradistinction to the present system of dairy inspection, to lay more emphasis upon the product than upon the premises. All dealers are required to furnish the names of all persons from whom they obtain milk.

"The State Department of Health, after public hearings, may make rules and regulations relative to the sanitary control of milk, relative to bacterial content before and after pasteurizing, and relative to the grading of milk. These rules and regulations do not become operative until they have been approved by the governor and council.

"The grading system is defined, and is in substance similar to that of New York City. Its operation will be gradual, however, and will be so regulated that six years will elapse before it is in force throughout the entire state. It is proposed to begin the operation of the system on December 1, 1917, in cities of more than 75,000 inhabitants.

"The bill permits the State Department of Health to prohibit the sale of milk which is liable to cause disease, and the department is authorized to recompense a producer of milk for pecuniary loss under these sections if he first notifies the department of the existence upon his premises of a disease capable of transmission through milk."

This bill was introduced into the legislature by Senator Clark of Plymouth, and will probably be known by his name. The first hearing upon it was held at the State House on Tuesday, March 28, before a joint session of the committees of agriculture and public health. Further hearings will doubtless be held. The attention of members of the medical profession is earnestly directed to this important measure, whose passage is strongly approved by the JOURNAL, and should go far towards establishing the control of the milk supply in Massachusetts upon a secure and satisfactory basis.

On April 4 a second hearing was held on the Clark bill, at which a number of opponents, as well as advocates of the measure, were heard. Alternative measures were presented by Representatives Leary and Pratt.

The Leary bill is based on the Clark bill as a framework, but provides for a new commission for the purpose of drafting rules and regulations for the control of the milk industry. The commission, it is provided, should be composed as follows:

"The State Department of Health, the Health Commissioner of Boston, the chairman of the Board of Health of Worcester, the chairman of

the Board of Health of Fall River, the chairman of the Board of Health of Springfield, the agent of the Dairy Bureau of the Massachusetts Board of Agriculture, the President of the Massachusetts Milk Inspectors' Association, a member of the executive committee of the State Grange of Massachusetts, sitting jointly, shall, with the approval of the Governor and Council, frame reasonable rules and regulations, not inconsistent with law, relative to the sanitary conditions of the production, transportation, care, handling, storage, pasteurization, grading and distribution of milk."

The Pratt bill (House No. 1478) embodies local self-control of the milk situation, and provides for grading of the milk product. It does not, however, provide adequately for the inspection of out-of-state milk.

It seems that there is no question of the preferability of the Clark bill as approved by the State Health Commission, to all of these alternative measures. Unfortunately, at the joint executive session of the Committees on Public Health and Agriculture, on April 11, it was voted by a majority of the members to recommend that the proponents of all three bills be given leave to withdraw. If this committee report is accepted by the legislature, there will, therefore, probably be no milk legislation at the present session of the Massachusetts General Court.



STANDARDIZATION OF TUBERCULOSIS TREATMENT.

THERE are at present pending before the National Congress several proposed measures looking toward the standardization of the treatment of tuberculosis in the United States and toward the elimination of the evil of the assisted migration of indigent tuberculous patients. In the issue of the JOURNAL for February 3, 1915, we commented editorially on one of these bills, introduced by a congressman from Massachusetts. An alternative measure has been introduced into the Senate, and another, similar to it (H. R. 8352) has been introduced into the House of Representatives by Congressman Kent of California. The text of this Kent bill is as follows:

"Section 1. That within the appropriations made from time to time for such purposes, the secretary of the treasury is hereby authorized to aid state authorities in providing care and treatment for indigent tuberculous persons who are

citizens of the United States, but not legal residents of the states in which they are temporarily located, and for this purpose may designate such public or private hospitals and sanatoria as may be necessary. Prior to being designated to receive patients, and from time to time, said institutions shall be subject to inspection by officers of the Public Health Service in order to determine the facilities and methods available and in use for care and treatment of patients, and the secretary of the treasury is further authorized to prescribe standards, to which institutions shall conform in order to obtain the benefits of this act.

"Sect. 2. That hospitals and sanatoria designated in accordance with the provisions of this act shall be entitled to and may receive from the federal treasury a subvention fixed annually by the secretary of the treasury, but not exceeding 75 cents per diem for each indigent patient admitted with the approval of the secretary of the treasury: provided, that the state in which said indigent tuberculous patient is admitted to a hospital or sanatorium for treatment shall pay, or cause to be paid, a subvention, not less than that paid by the federal government, toward the cost of caring for such patient in said hospital or sanatorium. Subventions under this law will be granted only in the case of indigent patients who have submitted satisfactory evidence that they were not assisted by any person or institution to leave their legal residence or did not themselves leave in order to receive benefits under this act.

"Sect. 3. That the secretary of the treasury is authorized to issue regulations governing the designation of institutions and establishment of standards and for otherwise carrying out the provisions of this act; and he is further authorized to collect and make available for general use information and descriptive matter relative to the construction, equipment, and maintenance of hospitals, sanatoria, and similar institutions.

"Sect. 4. That detailed estimates of the sums required annually to carry out the provisions of this act shall be submitted hereafter in the usual book of estimates."

In a circular letter, addressed to the medical profession of the United States, the author of the bill writes as follows of its purposes:

"This bill is the result of careful study and consultation, not only with the leading medical men, but also with the secretary of the treasury and the surgeon-general, Dr. Rupert Blue. The provisions are simple and obvious. One object of the bill is to standardize the treatment of tuberculosis by means of federal assistance, with the voluntary coöperation of the states. No one in the medical profession can doubt the wisdom of preventing the migration of indigent victims of tuberculosis, another object worthy of accomplishment. This migration is a hideous cruelty, and is contrary to all recent developments of medical science as applied to this disease. It is

universally recognized that, granted good outdoor air, rest, suitable nourishment, and cheerful surroundings, there is little choice in the matter of climate.

"The theory that climate, unaided by nutrition, rest, and calmness of spirit, will cure this disease causes a continuing migration of physical and financial wrecks to regions where they are friendless and without possibility of employment or support, so that they become stranded, under conditions that must necessarily lead to neglect, depression, and resultant death. Moreover, these victims are frequently placed in public institutions, which are unable to give proper treatment.

"Wherever such neglected cases are found, there are present most dangerous sources of infection. We do not permit the transportation of victims of smallpox, except under most careful conditions, and yet we have been oblivious of our duty to prevent the dissemination of this commonest and most serious of all human maladies.

"The Federal Government can well afford to make the small contribution suggested toward the relief of the great class of citizens who would be benefited by this bill, for it is now recognized that tuberculosis is peculiarly a disease of poverty and malnutrition, the control and eradication of which is in the province of the federal health service.

"You will note that by the terms of the bill it is optional whether the states accept the law and coöperate with the federal government, which obviates any criticism based on supposed federal interference with the functions or rights of the states. You will also note that the states may pay, or cause to be paid, an amount at least equal to that to be contributed by the federal government. This means that any state tendering its coöperation can pay its proportion either directly from the state treasury or from any other source that it may levy upon, and that the state shall be responsible for the payment of the fund to any agency which it may authorize, whether state, county, municipality, or private institution.

"The bill is purposely free from technicalities, in order that latitude may be granted for the establishment of rules by the surgeon-general. There is no medical man in the nation that more deservedly enjoys the confidence of our citizens. His record in fighting the bubonic plague in San Francisco and his subsequent career has fitted him to a remarkable degree for inaugurating this great work.

"If you believe in the purpose of the bill and desire its enactment into law, I would respectfully suggest that you forward your indorsement of it to the senators from your state and to your representatives in Congress. I would greatly esteem a statement of your views."

As we pointed out in our previous editorial, we are not disposed in theory to approve of the

principle of subsidy involved in this bill; but in practice it has seemed to work well, and not without justice, under comparable conditions in this community. It aims not merely to standardize the treatment of tuberculosis in the United States, but to provide federal aid in caring for tuberculous indigents. The bill was drawn in coöperation with Dr. Philip King Brown of San Francisco, and has been approved by Mr. Henry Phipps, founder of Phipps Institute, by the late Dr. Henry B. Faville of Chicago, and by several prominent Boston physicians. The attention of our readers is called to this important piece of proposed legislation, and they are urged, if their opinions concur in favoring the measure, to communicate upon the subject with their representatives in Congress.

MEDICAL NOTES.

AMERICAN PEDIATRIC SOCIETY.—The twenty-eighth annual meeting of the American Pediatric Society is to be held at Washington, D. C., on May 8, 9 and 10, in conjunction with the Congress of American Physicians and Surgeons. The preliminary program of the sessions on May 8 includes papers by Dr. Richard M. Smith on "The Mode of Infection in Pyelitis in Infancy" and by Dr. Maynard Ladd on "Homogenized Olive Oil Mixtures." At the morning session on May 9 Dr. John Lovett Morse will present a study of the etiology of chorea. The afternoon session of May 9 will be devoted to a symposium on syphilis, with papers by Dr. John A. Fordyce and Dr. Homer B. Swift of New York and Dr. Hugh Cabot of Boston. At the evening session on May 9, the presidential address will be delivered by Dr. W. S. Thayer of Baltimore. The afternoon session on May 10 will be devoted to a symposium on immunization and its practical applications, with papers by Dr. Theobald Smith of Princeton, Dr. Ludwig Hektoen of Chicago and Dr. William H. Park of New York.

ARMY MEDICAL MUSEUM.—The following request has been received from the office of the Surgeon-General:

"The Army Medical Museum possesses a valuable collection of medals relating to medicine, which was started and fostered by the late Dr. John S. Billings, and it is highly desirable that this collection should be added to and completed, as far as possible. To this end, the assistance and advice of physicians who are collectors of medical medals is respectfully solicited. The museum appropriations will avail to purchase individual medals which are not in our collections, the purchase of private collections, or of individual items in them, will be carefully

considered, private donations of separate medals or groups of medals will be most welcome and will be duly credited to the donors, and the transmission of catalogues of medals for sale is requested. If physician-collectors will bring this notice to the attention of antiquarian establishments having medals for sale, the favor will be most highly appreciated."

EUROPEAN WAR NOTES.

AMERICAN HOSPITALS IN GERMANY.—Report from New York on March 31 states that Dr. Arthur von Briesen, chairman of the American Physicians' Expedition Committee, has recently received from the United States Embassy in Berlin a letter expressing the praise and approval of the German government for the two hospitals established and maintained in Germany by the committee during the war. Arrangements have been made by the German government to establish a third American hospital, which is to be in charge of Dr. H. M. Richter of Chicago. The committee has already sent to Germany three units of surgeons and nurses, who are at present caring for nearly one thousand wounded soldiers.

WAR RELIEF FUNDS.—On April 22 the totals of the principal New England relief funds for the European War reached the following amounts:

Red Cross Fund	\$145,360.70
Jewish Fund	137,186.63
Belgian Fund	114,198.30
Serbian Fund	85,696.04
Allied Fund	83,877.15
French Wounded Fund	70,948.36
French Orphanage Fund	39,160.77
Armenian Fund	36,777.39
Polish Fund	29,644.06
Surgical Dressings Fund	23,687.17
LaFayette Fund	19,700.53
Italian Fund	17,066.81
P. S. D. Fund	8,113.83
Cardinal Mercier Fund	4,258.00
Lithuanian Fund	2,192.74
Scottish Hospitals Fund	1,163.80

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 22, 1916, there were 234 deaths reported, with a rate of 16.05 per 1000 population, as compared with 270 and a rate of 18.81 for the corresponding week of last year. There were 35 deaths under 1 year, as compared with 48 last year, and 66 deaths over 60 years of age, against 84 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 71; scarlet fever, 42; measles, 165; whooping cough, 24; typhoid fever, 0; tuberculosis, 50.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 7; measles, 1.

Total deaths from these diseases were: Diphtheria, 4; measles, 3; whooping cough, 1; tuberculosis, 31.

Included in the above were the following deaths of non-residents: Diphtheria, 1; tuberculosis, 4.

RHODE ISLAND SOCIETY FOR MENTAL HYGIENE.

—The Rhode Island Society for Mental Hygiene was organized and incorporated March 21, 1916. Its aims and purposes are to work for the conservation of mental health; to assist in raising the standards of care and treatment for those individuals who suffer from or are in the danger of developing a mental disorder; to study and assist in the proper care of the delinquent child, one of the most important social and humanitarian problems; to promote the study of feeble-mindedness, epilepsy and inebriety; and to distribute knowledge concerning the causes, the treatment and prevention.

The officers are: President, Rathbone Gardner; vice-presidents, Pres. W. H. P. Faunce, R. H. I. Goddard, Jr.; treasurer, Zechariah Chafee; executive committee, Dr. G. Alder Blumer, Dr. A. H. Harrington, Dr. Charles A. McDonald, Dr. Arthur H. Ruggles, Prof. James Q. Dealey, Judge Howard P. Gorham; secretary, Frederic J. Farnell.

SALE OF THE ACADEMY OF MEDICINE, SPRINGFIELD, MASS.—The Academy of Medicine and property at 359 State Street, have been sold to Dr. F. C. Brigham. The disposal of this property has been thought advisable for some time by the Academy members. The estate furnished considerable property that was not of use to the Academy, and that fact, together with troubles in caring for the property and the expense of upkeep, decided the directors to make this move. They plan to lease suitable quarters in some new building in the central section of the city, and by saving the incidental costs of keeping up such a large estate, it is thought that the Academy will have a large fund to spend for educational purposes. The officers elected for the coming year are as follows: president, Dr. H. W. Van Allen; first vice-president, Dr. A. O. Squier; second vice-president, Dr. H. L. Smith; secretary, Dr. L. D. Chapin; treasurer, Dr. Allen G. Rice. Directors elected for five years are Dr. J. B. Comins and Dr. R. B. Ober; censor for five years, Dr. H. C. Martin.

MEDICAL MEETING AT MONSON STATE HOSPITAL.—The Monson State Hospital, at Palmer, Mass., has extended to all physicians an invitation to attend a meeting on May 4, to review the twenty years' work of this hospital. The forenoon session will be devoted to matters of general consideration, inspection of various departments, exhibits and demonstrations. Luncheon will be served at 1.30 p.m. At the afternoon session Dr. H. R. Stedman will speak on the founding of the Monson State Hospital. Dr.

E. E. Southard will give a summary of researches in epilepsy, an account of the whole brain sections made, a study of the brain of an educated deaf mute, and a general account of the work done at this hospital under his department as state pathologist. Other papers will be read by:

Dr. W. G. Chase on an account of the moving picture work done at the Hospital.

Dr. G. A. Moore, Palmer, Mass., on eye work at Monson State Hospital.

Dr. C. W. Page, Hartford, Conn., on "The Medical Value of Optimism."

Dr. L. B. Alford, St. Louis, Mo., "An Etiological Study of a Series of Epileptics."

Dr. Annie E. Taft, "Appearances of the Corpus Callosum in Unilateral Brain Atrophy," with photograph demonstrations.

Dr. Everett Flood, Superintendent of the Hospital, will give a review of the library.

Dr. M. B. Hodskins, Assistant Superintendent, will speak on "Body Types in Epileptics."

Dr. R. A. Greene, Senior Assistant Physician, on "Forms of Epileptic Insanity So Far Observed at the Monson State Hospital."

Dr. D. A. Thom, Pathologist, and Dr. E. S. Bundy, Assistant Physician, on "Epileptic Dementia."

TO BE READ BY TITLE.

Surgical Work at the Monson State Hospital, by Dr. Walter R. Weiser, Springfield, Mass.

Impacted Wisdom Teeth as a Cause of Epilepsy, by Dr. J. F. Roche of Palmer.

Oral Hygiene, by Dr. L. W. Miner of Boston.

Congenital Syphilis as the Causative Factor in Epilepsy, by Dr. H. C. Solomon of Boston and Dr. M. B. Hodskins of Monson State Hospital.

Epileptic Deterioration with Recovery,—A Case Report, by Dr. D. A. Thom, Monson State Hospital.

Alcohol and Its Relation to Epilepsy and Allied Convulsive Disorders, by Dr. D. A. Thom.

Note with Brain Photos on Internal Hydrocephalus in Epileptics, by Dr. D. A. Thom.

An Unusual Lesion of the Ependyma, by Dr. D. A. Thom.

Second Note from the Monson State Hospital, on the Frequency of Epilepsy on the Offspring of Epileptics, by Dr. D. A. Thom.

Nationality of Patients at Monson State Hospital, by Dr. H. T. Cleaves, Monson State Hospital.

Non-Protein Nitrogen Content of the Blood of Epileptics, by Dr. H. Caro, Monson State Hospital.

CAMP SANITATION.—Dr. E. W. Kelley of the Massachusetts State Health Department addressed the engineering corps of the Massachusetts Institute of Technology recently on the timely subject of "Camp Sanitation." While the plans for military preparedness may give especial interest to this subject at this time, it is one which always needs attention. Not only are there the camps of soldiers in regular work, as in Mexico at this very instant; the musters for a day or two in military evolutions; the preparedness camps at Plattsburgh and elsewhere, but also the business camps of contractor firms engaged in public or private construction or in lumbering operations. Then there are the groups of men and women who love the outdoors; there may be included the camps of the Boy Scouts; and, finally, there is the movement fostered by the United States Government to rent camping sites in large numbers in the White Mountain reservations to those who care

to apply for them. Each group is of a different order and to be treated in a somewhat different manner in point of minor technic, although the same fundamental principles underlie all the groups of camps. Dr. Kelley spoke of the two potential dangers from the sanitary point of view, the first to its occupants and the second to the outside world. He considers the first essential to any camp is water supply, and for the second in importance the conditions of food preparation, while the disposal of the wastes and fly protection is the third preventive principle. The neglect of any one of the three is fraught with a danger that may not be confined to the limits of the camp, and its personnel.

MASSACHUSETTS BABIES' HOSPITAL CLOSES.—Finding that the work for which it was incorporated has been adequately carried on by similar institutions, the Massachusetts Babies' Hospital has petitioned the legislature to permit it to transfer its funds to a kindred institution. The Boston Children's Aid Society has agreed to accept the trust, and the attorney-general has given his consent.

MEDICAL WOMEN'S ASSOCIATION.—The annual meeting of the Medical Women's Association for aiding medical work in foreign countries was held at Boston on April 11. There were addresses by Dr. Belle Allen of Baroda, India, on the medical situation in China, and by Dr. Mary Stone, a graduate student of Johns Hopkins University, under the Rockefeller Foundation on her hospital work at Kiu Kang, China.

WINCHESTER VISITING NURSE ASSOCIATION.—The annual meeting of the Winchester Visiting Nurse Association was held at Winchester, Mass., on April 11. Reports were presented from the several committees, including the committee on the Winchester Hospital.

The hospital building fund is now approximately \$50,000, besides the lot of land, which is free of debt. In addition there has been a bequest from the Slater estate of \$10,000 for a home for the nurses. Work was begun on the hospital building last week and it is expected that it will be ready for occupancy the first of the year. About \$15,000 remains to be raised by subscriptions to complete the fund necessary for the building.

Miss Mary L. Beard, director of the Instructive District Nursing Association of Boston, gave a talk on the work of that organization. Mrs. Coit, the first president of the Visiting Nurse Association. Miss Katherine Pond and Dr. Clarence J. Allen also spoke.

DENTAL ALUMNI ASSOCIATION MEETING.—The Boston and Tufts Dental Alumni Association held its annual dinner on April 12. The officers of the class of 1916 were invited as guests of honor. The following men were elected for office during the coming year: Dr. F. A. Sawyer,

president; Dr. P. H. Barton, vice-president; Dr. George H. Payne, treasurer; Dr. H. W. Perkins, secretary; and Dr. A. G. Richburg, editor, and the following executive board: Dr. P. H. Barton, chairman; Dr. E. W. Moore, Dr. T. H. Moran and Dr. A. G. Richburg.

MASSACHUSETTS HOMEOPATHIC MEDICAL SOCIETY.—The annual meeting of the Massachusetts Homeopathic Medical Society was held on April 13. Papers were read by Dr. Conrad Wesselhoeft, Dr. John P. Sutherland, Dr. J. Herbert Moore, Dr. Orville R. Chadwell and Dr. Horace Packard. At the dinner held in the evening, Dr. G. Forrest Martin of Lowell presided, and Dr. DeWitt G. Wilcox made an address on "The Psychology of Laughter." The following officers were elected for the coming year: Dr. J. Emmons Briggs, of Boston, president; Dr. DeWitt G. Wilcox, of Boston, and Dr. Elmer H. Copeland, of Northampton, vice-presidents; Dr. Edward S. Calderwood, of Roxbury, recording secretary; Dr. Benjamin T. Loring, of Boston, corresponding secretary; Dr. Thomas M. Strong, of Boston, treasurer; Dr. G. Forrest Martin, of Lowell, chairman of the censors.

MASSACHUSETTS ANTI-TUBERCULOSIS LEAGUE.—The Massachusetts Anti-Tuberculosis League will hold its second annual meeting and conference at the Twentieth Century Club, 3 Joy Street, Boston, on Thursday, April 27. The program is as follows:

"Introductory Remarks by the President," Vincent Y. Bowditch, M.D.

"The Plan of the State Department of Health for More Tuberculosis Hospitals," Eugene R. Kelley, M.D., Director, Division of Communicable Diseases, State Department of Health.

"The Relation of the Anti-Tuberculosis Society to the Local Board of Health," John W. Tapper, Chairman, Lynn Board of Health.

"The Visiting Tuberculosis Nurse," Mary Van Zile, R.N., Executive Secretary, Public Health Dispensary Commission, Beverly.

"Tuberculosis in Rural Communities," Vanderpoel Adriance, M.D., Williamstown.

"Some of the Problems of the Trustees of Massachusetts Hospitals for Consumptives," Arthur K. Stone, M.D., Chairman, Trustees of Hospitals for Consumptives.

"The Value of a Program of Work for Anti-Tuberculosis Societies," Mrs. William H. Lothrop, Newtonville.

The latter part of the morning session there will be a report from the Treasurer and Secretary, and election of officers and executive committee for the ensuing year. Before the afternoon session, there will be an opportunity to see an exhibit on "Open Air Schools" and on "Health in Industry." Each of these exhibits consists of about 75 photographs mounted on uniform cards. Mrs. Anna M. Staebler, Secretary, Committee on Health in Industry of the Boston Association for the Relief and Control of

Tuberculosis, will be in attendance part of the time, after the morning session, to explain the "Health in Industry" exhibit to those who are interested. The public is invited.

Miscellany.

MASSACHUSETTS MILK LEGISLATION.

In another column of this issue of the JOURNAL is published an editorial comment on the present milk situation in Massachusetts, on the legislation which has been undertaken for its control and on the report of the Massachusetts Milk Board, upon which the McLaughlin milk bill now pending before the Massachusetts General Court, is based. The following is a reprint in part of the conclusions of that report and of the full text of the bill.

REPORT OF MASSACHUSETTS MILK BOARD.*

"Massachusetts dairymen must produce milk of a superior quality if they are to hold the confidence and patronage of the consumers of the Commonwealth. As far as statistics are available, it would appear that Massachusetts dairymen produce more milk per cow than dairymen of neighboring states and countries, and produce it under generally better conditions as to cleanliness. Nevertheless, milk production in Massachusetts has rapidly decreased since 1890.

"To supply the steadily increasing population of the state with milk and cream, the large dealers of Boston and other cities have been going to points in other states (principally Maine, Vermont and New Hampshire) and the Province of Quebec to secure adequate supply. The great distance of some of these points, together with careless handling and slow transportation, tend to place a large amount of milk on the Massachusetts market which is less desirable than milk produced nearby.

"Sufficient milk to supply Massachusetts people could be produced within the borders of the state if the thousands of acres of naturally good dairy lands now lying idle were stocked with milch cattle. The principal reason for the decline in dairying in this state is the low price paid to producers. Other causes are the increase in the cost of cows, grain, building materials, labor and the improved methods demanded by state and municipal authorities, as well as constant legislative agitation for several years.

"Milk can be bought at lower prices at out-of-state points than Massachusetts farmers can produce it with profit. Milk transportation rates are lower in proportion for long haul than

for short haul. Massachusetts dairymen have been in general subjected to a more rigid enforcement of dairy rules and regulations than out-of-state producers of milk.

"Massachusetts dairymen furnishing milk for nearby consumption must compete with an inferior grade of milk produced out of state, which has been freed from disease germs by pasteurization, and has been rendered microscopically acceptable to the consumer by clarifying processes to remove filth originally introduced by slovenly dairy methods.

"Owing to the fact that in Massachusetts there are scarcely any country receiving milk stations, milk produced in Massachusetts must be marketed more quickly than milk produced out of state, which has been clarified and pasteurized before being shipped.

"It would be an advantageous practice if Massachusetts dairymen would label state-raised milk as 'Massachusetts milk,' particularly if a state authority could, after examination, permit its sale as a distinct grade of milk.

"In addition to epidemic diseases, the evidence is now conclusive that a very considerable proportion of tuberculosis in children is due to infection by the bovine type of tubercle bacilli taken into the body by drinking raw milk. Bovine tuberculosis is prevalent to a dangerous degree in ordinary dairy herds. Dairymen should attempt to eradicate tuberculosis from their herds, not only in the interest of public health, but also to improve the quality of their young stock. Adequate pasteurization as effectively destroys tubercle bacilli as it does the germs of epidemic diseases.

"Some part of our excessively high infant mortality rate is probably due to unwholesome qualities of the cow's milk furnished to infants. It is generally admitted, however, at present by children's specialists and sanitarians that the use of cow's milk, regardless of quality, furnishes only one among many factors in the total causes of infant mortality.

"There appears to be some grounds for concluding that in some cities of this Commonwealth the inadequacy of the total supply of cow's milk for infants and young children is a more serious public health problem than any existing deficiencies in quality.

"The present laws for the supervision of milk production and distribution in Massachusetts gives ample authority to the cities and towns to protect their milk supplies in as stringent and thorough a fashion as they may see fit. These laws make it mandatory upon cities and towns to carry out thorough dairy inspection in all dairies supplying milk for their consumption.

"The present system of sanitary supervision of milk by local authorities is in the aggregate costing the people of the Commonwealth fully as much, if not more, than a complete, well-balanced uniform system of control.

"As these laws are carried out, the practical

* This report is summarized at greater length in the monthly bulletin of the Massachusetts State Department of Health, for February, 1916.

results are that the inhabitants of many cities and towns receive no protection whatsoever and the inhabitants of many other cities and towns receive protection at the expense of the taxpayers in neighboring cities. Responsibility is divided, official friction between cities and towns is incurred. The literal carrying out of the laws would result in an inconceivable mass of overlapping inspections. The producer not having a fixed standard, owing to the changing and contradictory orders of local milk inspectors, is confused and discouraged.

"There is no law at present providing for state control of the milk supply of this Commonwealth relative to the public health. The systematic dairy inspections instituted in this state by the State Board of Health, and subsequently carried on by local authorities, have been productive of improved dairy conditions and an improved milk supply, many producers having taken advantage of the opportunities of obtaining valuable information from the inspectors.

"The clean milk contests of the State Board of Agriculture have been productive of much good among those producers who distribute milk of their own production direct to the consumer.

"Milk production should be so supervised as to result in a maximum of cleanliness and safety with a minimum of interference with the milk industry.

"At the present prices, or even at considerably higher prices than those prevailing at present, milk is one of the most economical of foods. There are no reasonable grounds for believing that the retail price of milk can be lowered.

"Milk should be bought and sold on its merits as determined by its chemical and bacteriological condition, rather than by volume only. This should include higher price for higher fat content and higher price for low bacterial content.

"Pasteurization or sterilization is the only practical method for insuring the safety of commercial milk. No epidemic has ever been traced with certainty to pasteurized milk. The present uncontrolled method of pasteurization does not furnish a satisfactory safeguard to the public. To make certain of the adequacy of the processes of sterilization or pasteurization, the responsibility therefor should rest upon public health officials. Employees in commercial pasteurizing plants should be subjected to routine physical examination. Pasteurization should not be allowed to be used to conceal an inferior quality of milk.

"Fresh milk has a greater food value than other milk. Milk, while in the possession of the consumer, should be no less scrupulously cared for than while in the hand of the producer or dealer. It should be immediately placed in a cool place and kept there, duly protected until used.

"All milk bottles received by the consumer should be washed with soap and hot water as soon as the milk has been removed, and should be kept clean until returned to the dealer. Milk bottles should never be used for anything but milk, as is provided for by statute."

TEXT OF THE McLAUGHLIN MILK BILL.

AN ACT RELATIVE TO THE INSPECTION OF MILK.

SECTION 1. The State Department of Health, after public hearings, is hereby authorized to frame reasonable rules and regulations relative to the sanitary conditions of the production, transportation, care, handling, storage and distribution of milk, which rules and regulations shall take effect after the approval of the Governor and Council.

SECT. 2. The State Department of Health may by its rules and regulations establish grades of milk based upon the butter fat content, sanitary conditions of dairies, and the bacterial content of milk before and after pasteurization, and shall fix methods of pasteurization. After the establishment of such grades, all milk sold or offered for sale within the Commonwealth, if graded, shall be graded according to the standards established by the State Department of Health rules and regulations. The board of health of any city or town may require all milk offered for sale within their jurisdiction to be so graded whenever the interests of the public health shall in their judgment render it necessary and advisable to do so.

SECT. 3. No license under the provisions of Chapter 443 of the Acts of 1909, and no permit under the provisions of Chapter 744 of the acts of 1914, shall be issued to any person, firm or corporation who has not complied with the rules and regulations established under the provisions of Section 1.

SECT. 4. Boards of health of cities and towns may require pasteurization, in accordance with the methods as established under Section 2 of any or all milk offered for sale or processed within their jurisdiction, whenever the interests of the public health shall render it necessary or desirable to do so, but no re-pasteurized milk shall be sold or offered for sale within the Commonwealth.

SECT. 5. Whoever, himself, or by his servant or agent, or the servant or agent of another person, violates any of the rules or regulations established under the provisions of this act or violates any of the provisions of this act shall be punished by a fine of not more than \$100.

SECT. 6. Boards of health of cities and towns shall enforce the provisions of this act and all rules and regulations established hereunder. If the board of health of any city or town shall neglect or refuse to enforce the provisions of this act, or the rules and regulations established hereunder, the State Department of Health shall have the power to enforce all such provisions, rules and regulations, and the cost of the

same shall be paid into the treasury of the Commonwealth by such city or town.

Sect. 7. If, after thirty days' notice in writing by the State Department of Health, the board of health of any city or town refuses or neglects to enforce the provisions of this act and the rules and regulations established hereunder, said city or town shall be subject to a penalty of not less than \$10 per day for each day's failure so to comply. Said penalty to be enforced by appropriate action brought in the name of the Commonwealth by the attorney-general on complaint of the State Department of Health; provided, that if the board of health or the board of selectmen acting as a board of health of any town shall, by resolution filed with the State Department of Health, not less than ninety days prior to the first day of June of any year, request the State Department of Health to take over and exercise the powers and perform the duties conferred or imposed upon local boards of health by the provisions of Chapter 744 of the Acts of 1914, or by the provisions of this act or by the rules and regulations established hereunder, the State Department of Health shall take over and exercise such powers and perform such duties for such year, and such towns shall not be liable to the penalty imposed by this section.

Sect. 8. The sum of \$10,000 is hereby appropriated to the State Department of Health for the enforcement of the provisions of this act.

Sect. 9. This act shall take effect on June 1, 1916.

WORKMEN'S COMPENSATION ACT. DECISION OF THE SUPREME JUDICIAL COURT OF MASSACHUSETTS, IN THE PECOTT CASE, APRIL 12, 1916.

CARROLL J. The employee, was injured Saturday, October 31, 1914, between half past eleven and twelve o'clock. As usual on Saturday, the mill closed at noon. In the afternoon, the pain from the injury became intense and he consulted Dr. Cregg, who advised an operation. Monday the employee made an attempt to notify his foreman of the injury, and failing in this, he left word by telephone with one of the office employees. Wednesday, November 4, 1914, he was operated on for hernia.

At the time the plaintiff was injured there were posted in the mill where he worked, printed notices informing employees that, in case of injury, Dr. Carl R. Moeckel or Dr. Howard L. Cushman was to be called, "bills of other physicians will not be paid by the insurance company." No attempt was made to notify these physicians of the injury, the employee making no effort to secure their services. Dr. Cregg performed the operation. It is agreed that his charge is reasonable, and the question is whether under these circumstances, the company is required by the Workmen's Compensation Act to

pay for the services of a physician not furnished by it, but selected by the employee.

Under the Workmen's Compensation Act, the reasonable medical services required during the first two weeks after the injury, are to be furnished by the insurer; the duty of supplying medical aid being imposed upon the insurance company, with the obligation of paying therefor. The right to select the attending physician is given to it by the statute. It is evident, we think, that the Legislature in passing this act, did not intend to give to the employee the privilege or right of selecting his own physician at the expense of the insurer. Under the amendment of 1914, where a physician other than the one provided is called in case of an emergency, or for other justifiable cause, the insurer is required to pay for this service, if in the opinion of the Industrial Accident Board the charge is reasonable and the cause of employment justifiable. The purpose of the Legislature in passing this amendment was not to deprive the insurer of the right to select its own physicians. By this change in the law, provision was made for the case of emergency, where there was imminent danger, where the suffering and pain were severe, where immediate attention was required, and the services of the insurance physician could not be obtained in time to give adequate relief. The amendment was also intended to apply to a situation where there was no actual emergency, but where the employee, acting as a reasonable man, would be justified in refusing the care of the physician selected by the company. There is nothing in the record of this case to show such an emergency, or any cause which would justify a reasonable man in neglecting to seek the attention of the physicians named.

Even if on Saturday afternoon, when the pain was intense, an emergency then existed which made it prudent to call Dr. Cregg, and he could respond more quickly than the physician of the company, and the employee was justified in sending for him (which we are not called upon to decide), there is nothing in the evidence which discloses any such emergency existing on the Wednesday following, when the services were rendered, and nothing is shown which would justify the employee in failing to secure the services of the physicians offered by the insurer.

In Panasuk's case, 217 Mass., 589, it was held, that the employee, an "illiterate foreigner, unable to read, write or understand the English language," was not bound by a notice printed in English.

In the case at bar the plaintiff could read and speak English; notices were conspicuously posted, we think he was charged with knowledge of them and their contents, and there is no evidence which justified him under the statute in neglecting to secure the services of either of the physicians named. Daniels v. New England Cotton Yarn Co., 188 Mass., 260. His igno-

rance of his rights under the Workmen's Compensation Act, cannot excuse him from compliance with its terms. McLean's Case, ante.

Decree reversed.

APPOINTMENTS.

DR. HORACE K. BOUTWELL has been appointed dispensary physician of Brookline, Mass., to succeed Dr. Charles H. Lawrence.

DR. FRANCIS P. DENNY, agent of the Brookline Board of Health, DR. AUGUSTA G. WILLIAMS and DR. ARTHUR A. CUSHING have been appointed members of the Brookline Dental Dispensary.

NOTICES.

THE TENTH "AUTHORS' EVENING" of ten papers on "Developmental Psychology," "The Formal Launching of a New Psychological View-point" by Walter B. Swift, A.B., S.B., M.D., in charge Voice Clinic; and Caroline A. Osborne, M.D., Ph.D., First Assistant, at the Voice Clinic, Psychopathic Hospital, 74 Fenwood Road, Brookline, Mass., will be held April 28, 1916, at 8 P.M.

Cases at 7.30.

Introduction: Outline of the First Note.

1. Developmental Psychology—General Principles.
2. Developmental Psychology not Educational nor Genetic.
3. Developmental Psychology in Childhood.
4. Developmental Psychology of the Normal Adult.
5. Developmental Psychology of a Student Type.
6. Developmental Psychology in the Age Periods.
7. Developmental Psychology for Personality Expansion.
8. Developmental Psychology of Stuttering.
9. Developmental Psychology in the Feeble-Minded.
10. Developmental Psychology among the Psychoneuroses.

Discussion by Drs. Harold E. Burt, F. Lyman Wells, Robert M. Yerkes.

Short Review of the Year's 100 Papers. Prophecy.

SOCIETY NOTICES.

SUFFOLK DISTRICT MEDICAL SOCIETY.

CENSORS' EXAMINATION.

The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 8 Fenway, on Thursday, May 11, 1916, at 4 P.M. Candidates, who must be residents of the Suffolk District, or non-residents of Massachusetts, should make personal application to the Secretary, presenting their medical diplomas at least three days before the examination. For further particulars, apply from 4 to 5 P.M. to DAVID CHEEVER, M.D., Secretary, 355 Marlborough St., Boston, Mass.

THE AMERICAN GASTRO-ENTEROLOGICAL ASSOCIATION. The nineteenth annual meeting of the American Gastro-Enterological Association will be held at Washington, D. C., Monday and Tuesday, May 8 and 9, 1916. The headquarters and all the sessions will be at the New Willard Hotel.

The medical profession is cordially invited to attend.

FRANKLIN M. WHITE, M.D., Secretary.

THE HARVEY SOCIETY.—The eleventh lecture of the series will be held at the New York Academy of Medicine, 17 West 43d Street, on Saturday evening, April 29, 1916, at 8.30 P.M., by Prof. William H. Welch, Johns Hopkins University. Subject: "Medical Education in the United States."

MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS.—There will be a meeting of the Massachusetts Society of Examining Physicians at the Copley-Plaza, Boston, on May 3, 1916, at 8 P.M.

PROGRAM.

1. "Mental States Responsible for Malingering." Dr. Ernest B. Emerson, Medical Director, State Hospital for the Criminal Insane.

2. "Psychopathic Personality as a Factor in Physical Diagnosis." Dr. Elmer E. Southard, Psychopathic Hospital, Boston.

3. "A Factor Often Overlooked in the Consultation Room." Dr. F. W. Anthony, Haverhill, Mass.

4. "Conditions Other Than Physical That Affect the Return of the Injured to Employment." Mr. Clark E. Woodward, Assistant Secretary, Massachusetts Employees' Insurance Association.

Discussion open by Dr. J. W. Courtney, Dr. H. B. Eaton, and Norman S. Hesseltine, Esq.

Dinner at 6.30 P.M.

JAMES H. STEVENS, M.D., Secretary.

RECENT DEATHS.

DR. SETH VALE GOLDTHWAITE, a retired Fellow of the Massachusetts Medical Society, died at his home Allston, April 9, aged 67 years. He was a graduate of the Boston University School of Medicine in 1880, and formerly practised gynecology in Boston. He is survived by his widow.

DR. SIR ALEXANDER RUSSELL SIMPSON, who died on April 6, at Edinburgh, Scotland, was born in 1835. He was emeritus professor of obstetrics to the University of Edinburgh and was formerly dean of the faculty of medicine in that city. He was the author of many widely-known medical works.

DR. THEODORE B. SACHS, who died on April 2 at Naperville, Illinois, was director of the Chicago Municipal Tuberculosis Sanatorium and president of the National Tuberculosis Association. He received the degree of M.D. in 1895 from the University of Illinois, and had been prominent as a practitioner and worker in the field of tuberculosis prevention. He was also president of the Chicago Tuberculosis Institute, a member of the Illinois State and Chicago Medical Societies and of the American Medical Association.

DR. SIMEON HUNT, who died on April 5 at East Providence, R. I., was born at Seekonk, R. I., on April 27, 1837, of Quaker parentage. He received the degree of A.B. from Dartmouth College in 1862 and that of A.M. in 1867. He first studied medicine as an apprentice in a physician's office at Haverhill, N. H., and obtained the degree of M.D. from Dartmouth in 1864. He immediately settled at East Providence where he continued active in the practice of his profession for over fifty years. He is survived by two sons, one of whom is also a physician.

DR. NATHAN OPPENHEIM, who died on April 5 in New York City, was born at Albany, N. Y., in 1866. He received the degree of A.B. from Harvard College in 1888 and that of M.D. in 1891 from the College of Physicians and Surgeons of Columbia University, New York. He early specialized in pediatrics and was attending physician at the New York City Children's Hospital, and at the Children's Department of the New York Red Cross Hospital. He was a member of many national, state and county medical societies, of local medical clubs and of the New York Academy of Medicine, and was author of several medical works on pediatrics.

DR. ALLAN M. CLEGHORN, formerly an assistant in physiology at the Harvard Medical School, subsequently naturalist for the Algonquin Park, Ontario, and recently serving as a Captain in the British Royal Army Medical Corps, has died in England. He was born in 1872.

DR. JOHN FRANCIS MOORE, a Fellow of the Massachusetts Medical Society, died at Worcester, April 15, 1916, aged 35 years. He was a graduate of the Baltimore Medical College in 1907.

The Boston Medical and Surgical Journal

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Original Articles.

OBSERVATIONS ON THE USE OF THE DUODENAL TUBE FOR DIAGNOSIS AND TREATMENT.*

BY FRANKLIN W. WHITE, M.D., BOSTON,

Instructor in Medicine, Harvard University; Visiting Physician, Boston City Hospital.

THE duodenal tube for adults was introduced by Einhorn and by Gross about five years ago. A much simpler tube for infants was used by Hess a year or two later.

My own use of the tube, which is limited to adults, was begun about two years ago in a rather skeptical spirit, fearing that the instrument was little more than a toy; that its use might be disagreeable to the patient and the results of doubtful value. I was encouraged, however, by finding that men of good judgment in different parts of the country were beginning to use it, and my own experience has convinced me of its value both for diagnosis and treatment.

It is a real contribution to medicine and deserves far greater use than is being made of it now. The field for its use, both in diagnosis and treatment, is somewhat limited, but it has great value in that field.

The tube was used in 90 cases: in 56 for diagnosis, in 34 for treatment. In this paper we wish simply to emphasize a few of the newer and more important points under three headings.

* Read at the thirtieth annual meeting of the Association of American Physicians, Washington, D. C., May 11, 1915.

First, the introduction of the tube, with a study of the factors which help or hinder its passage through the esophagus and stomach.

Second, the use of the tube in diagnosis.

Third, its use in treatment.

THE INTRODUCTION OF THE TUBE.

In infants, the introduction of the tube as described by Hess is a very simple and easy matter. The tube consists merely of a No. 14 or 15 French Nelaton urethral catheter which is not too flexible. Its introduction, which was recently demonstrated to me by Dr. W. W. Howell at the Infants' Hospital in Boston, consists simply in laying the baby on its back on a table and gently but steadily pushing the tube down the esophagus, through the stomach and into the duodenum in two or three minutes. This prompt and easy passage is made possible by the short, horn-shaped baby's stomach, with its small cavity and relative lack of tone at the pylorus. A simple catheter of this kind, unfortunately, cannot be used in the adult, in whom the stomach is large, and the tube wanders far from the pyloric opening. Harmer and Dodd have shown that such a simple catheter or tube in the adult stomach tends to stick to the wall, form loops and curl up.

The introduction of the duodenal tube in the adult stomach is a mild procedure, however, made easy by giving the patient a quarter grain of codeia an hour beforehand and the use of a throat spray of novocaine. Sometimes a few sips of water have been given at the time of swallowing it, but this is unnecessary. A common way of introducing the tube has been to let

the patient swallow it in the evening, lie down on the right side and trust the tip of the tube to find its way into the duodenum over night. This method has largely limited the use of the duodenal tube to patients in a hospital.

Following suggestions from Holzknecht's laboratory, a systematic study was made with the fluoroscope to determine the factors which help or hinder the passage of the tube through the stomach and esophagus in the hope of developing a rapid technic of introduction which could be used with office patients or out-patients of a hospital.

We are greatly indebted to Dr. Walter J. Dodd of Boston, for help and suggestions in the x-ray work.

The passage of the tube through the esophagus is a simple matter started by the swallowing mechanism and then largely helped by gravity in the erect position. It takes place more slowly in the horizontal position by peristalsis alone. The passage of the tip past the larynx is slightly uncomfortable and may make the patient gag. A stylet may be used to push the tip quickly past the larynx into the esophagus, but it is rarely needed. A spasm of the esophagus may, of course, delay the tube: it has not occurred in this series of cases.

In the stomach the factors are more complex. We have studied the effect of gravity, of peristalsis, of the presence of food, of the rate of feeding in the tube, of the shape of the stomach and of spasm, or obstruction at the pylorus. Gravity was found to have the most important effect; in passing the tube rapidly through the stomach, the lesser curvature forms a sloping curve along which the tip of the tube rapidly passes toward the antrum and pylorus, with an empty stomach and the patient in the erect position. If the erect position is continued and the tube steadily swallowed, the tip gravitates to the bottom of the stomach usually in the region of the antrum, and tends to remain there for a time and form a coil in this vicinity. It is possible, however, by putting the patient in different postures and carefully feeding in the tube to swing the tip to right or left or forwards, or back within the stomach and thus guide it in the desired direction.

The postures used were as follows:

The tube was usually swallowed with the patient erect, which carried the tip vertically down the esophagus to the cardia (about 40 cm.) and half way down the stomach (about 50 cm.).

For the second position the patient leans forward, slowly lies down on the abdomen and turns on the right side. This carries the tip forward in the stomach and to the right over the high ridge of the spine, and places it in the antrum near the pylorus (tube in 60 to 65 cm.). These postures have been used by Dr. Walter J. Dodd of Boston, and other radiologists for rapid filling of the first portion of the duodenum with a bismuth meal in horizontal fluoroscopy. They are

essentially the same as those used by Holzknecht in passing the duodenal tube.

For the third position the patient turns partly or wholly on the back with pelvis raised by a pillow, to slide the tip up close to the pylorus and help it through (tube in 70 to 80 cm.). This position also raises the hook-shaped stomachs, making them more transverse and easy to deal with, and the high ridge of the spine acts as a watershed and keeps the tip of the tube from dropping back into the left side of the stomach.

The use of a silk thread guide for the tip has been suggested to help its rapid passage into the duodenum. This means that the patient swallows about a yard and a half of twisted or braided silk thread the day before, which almost invariably finds its way into the duodenum. The capsule of the duodenal tube is then threaded down over this. While this silk guide is of great help in passing an instrument through a narrow place in the esophagus, it does not help the passage of the ordinary duodenal tube on account of kinking and friction, and, in fact, usually delays or prevents it.

Dr. Frank Smithies of Chicago has used a specially-made, long gum elastic French catheter with perforated tip which is passed rapidly into the duodenum over a string guide. The catheter is impregnated with metallic salts, is easily seen with the fluoroscope, and the position of the tip in the duodenum verified. He has found this a successful, rapid method of aspirating the duodenal contents. I have had no opportunity to use it through inability to get the French catheter.

The chief types of duodenal tube differ somewhat in their size and the weight of the tip, and vary also in the speed with which they can be passed through the stomach, largely on account of the action of gravity on the tips of different weight.

The Einhorn tube is small, with a No. 8 French tubing, with a long, oval, perforated tip of about 50 grains weight; the Gross tube is much larger with a soft No. 20 French tube and a large heavy tip of about 150-grains weight covered with rubber.

The Palefski tube is like that of Einhorn but has a heavier, shorter, oval tip weighing about 100 grains with only a few perforations. The heavier tips can be more readily placed close to the pylorus than the light ones by the action of gravity and the posture of the patient, and for this reason, the Gross tube and the Palefski tube, as a rule, enter the duodenum more rapidly than the Einhorn tube.

Each tube has its advantages. The Einhorn tube is small, easily swallowed, easy to retain, usually passes more slowly into the duodenum than the others, and occasionally plugs with mucus. We used it entirely for treatment and, frequently, for diagnosis.

The tube with the Palefski tip is likewise small, easy to swallow and retain, passes more

rapidly into the duodenum, as a rule, but on account of fewer openings in the tip, makes the aspiration more difficult at times than the Einhorn tube. This tube gave the best results for rapid aspiration of duodenal contents for diagnosis.

The Gross tube is only used for diagnosis. It enters the duodenum readily and is easy to aspirate on account of its large size, but the rubber-covered tip is rather large and clumsy and the tube is decidedly harder to swallow and retain. For these reasons we have not used it much.

The position of the end of the tube was determined either by the fluoroscope or by the milk test. The latter consisted in giving the patient a few swallows of milk and then aspirating gently through the tube after a minute. If the tip of the tube is in the stomach the milk promptly returns through the tube; if the tube has passed through the pylorus into the duodenum, the pylorus has almost always closed about it and no prompt aspiration of the milk is possible. This is the simplest clinical method of determining the position of the end of the tube for routine work and is reliable in almost all cases. If the pylorus is relaxed the milk may pass promptly into the duodenum and be aspirated through the tube, and thus the tip appears to be in the stomach when it actually is in the duodenum. This has rarely happened in my experience. Of course, the presence of some pancreatic ferments is not evidence in itself that the tube is in the duodenum. These may be obtained above the pylorus at times.

RESULTS.

The results show that the tubes reached the duodenum in about 30% of the cases within 15 minutes; in about 30% more within a half hour, and in about 20% more of the cases within one to six hours. In about 20% of the patients the tube had to be left in over night in order to reach the duodenum.

Some difficulties were met in adapting the routine to different sizes of patients and different sizes and shapes of stomachs.

The chief causes of delay was coiling up of the tube in the stomach if fed in too fast, and dropping back of the tip into wrong positions if fed in too slowly, especially, dropping back into the left side of the stomach, and to the left of the high ridge of the spine, when the patient turns from a right lateral position upon his back.

Peristalsis was found to have little effect on the rate of passage of the tube through the stomach until the tip is close to the pylorus, then peristalsis pushes it through.

Food delayed the passage of the tube through the stomach, largely by interfering with the action of gravity and the rapid placing of the tip close to the pylorus.

The tube could be passed through the empty stomach by the aid of posture in about a half hour in the majority of cases; the presence of

an ordinary meal would delay the passage of the tube three or four hours, or even more.

The rate of swallowing the tube affected the time of its passage through the stomach. This was more easily controlled in the tubes with a heavy tip. The tube passed on more steadily if it was swallowed at a rather slow rate. It was important not to try to feed it in too rapidly, for the tube tends to get ahead of the capsule, and kink or roll up, and delay its passage. It was desirable to have very little slack, but to have the capsule move along steadily ahead of the tube. This was best arranged as a routine by swallowing the tube to the 50 cm. mark in the erect position; then slowly in to 60 or 65 cm. in the second position; then slowly in to 70 or 75 cm. in the third position, taking about five minutes in each position.

The shape of the stomach had a definite effect upon the rate of the passage of the tube. The high, transverse, so-called "horn-shaped" stomachs hastened the passage of the tube, the vertical, hook-shaped, relaxed, and low stomachs delayed its passage from one-half an hour to an hour or more in the more marked cases.

Obstruction of the pylorus due to spasm or organic disease naturally delayed the passage of the tube, and in marked cases may render the test impossible by keeping the tip in the stomach. Fortunately, these conditions were rarely met with in the type of cases where the tube was used for diagnosis; where the spasm was associated with hyperacidity it was easily relaxed by the use of alkalis or atropin.

The practical application of the above data is as follows: the quickest way to enter the duodenum is to get the tube close to the pylorus within a short time. This is best accomplished by using a light tube with a heavy tip, swallowed by the fasting patient in the erect position, feeding the tube in slowly and steadily, and taking about five minutes in each of the three positions described.

From the above data it is seen that the attempt to develop a rapid method of passing the tube into the duodenum has proved a partial success. More than one-half of the cases were quickly intubed and disposed of. In a large percent., however, this was not possible, even with the use of the heavy tipped tube, and it was necessary to let the patients lie on the right side for several hours or more to reach the duodenum. In short, the quick method saves much time and usually works; the slow method was, however, more reliable, and always used if the first failed. Since so much depends upon a negative test for ferments in diseases of the pancreas, we must be sure that the tube is in the duodenum, and not in the stomach, and for this reason all negative results should be repeated, using, preferably, the slow method of introduction and the Einhorn tube. The rapid introduction of the tube is a more expert procedure than the slow over-night introduction and requires more atten-

tion on the part of the physician, but I have usually found that a nurse could handle the tube satisfactorily after a little experience and with careful directions.

(To be continued.)

HALLUX VALGUS.

BY CHARLES F. PAINTER, M.D., BOSTON.

In the past three years there have appeared two* papers on this subject by American authors. One of these discussed the subject thoroughly; the other dealt chiefly with the operative treatment. Perhaps there is nothing more to say now that is worth while in this connection—at least not before some new method of treatment has demonstrated its superiority over those already existing. However, it seems to me that there are two features, not sufficiently considered by those who have discussed the subject, that deserve recognition. One of these refers to the etiology of the trouble and the other concerns the most serious objection to that method of operative treatment which the majority of surgeons regard as highly satisfactory. If the following observations upon etiology are accepted, there can be no ground for the employment of certain of the methods of operative treatment advocated. When one regards the long list of surgical procedures that have been proposed, but little reflection is needed to see that there are more methods suggested than there are possible variations in the lesions of hallux valgus. At the most, this condition is merely a deviation of the great toe away from the median line, which deviation is accompanied by the formation of a bursa in a goodly proportion of cases, and certain other static disturbances in the foot, incident to it, all of which are painful and may be more or less disabling.

To meet this simple condition Metcalf has cited 15 different operations†. It would seem that there should be a single, simple method capable of meeting the surgical condition, applicable to all cases needing operative treatment. Such a procedure should be based upon a recognition of the etiological factors in the cases, as well as upon the physical conditions to be met by the operation.

Let us look for a moment at the anatomical conditions present in a hallux valgus. In the first place, it is not uncommonly the manifestation of an hereditary tendency. The type of foot which lends itself to the development, under the right sort of stress, of this deformity is probably what is inherited—not the deformity itself. One rarely sees a hallux valgus in a patient who has not the evidences of a "broken"

anterior arch, meaning by this a broad foot at the level of the metatarsal heads, a foot that is capable of considerable compression when the anterior arch is squeezed together behind the heads of the first and fifth metatarsals. There is often a flattening behind the metatarsal heads instead of a slight convexity. Usually the foot is arched in both directions at this point. There is often a great deal of callus formation beneath the anterior arch of the foot. There is frequently to be noted a tendency for the proximal ends of the phalanges to be depressed into the sole of the shoe, the angle which they make with the metatarsals being nearly a right angle. The great toe is apt to rotate to such an extent that the weight is borne on the side of this member rather than upon its plantar surface. Most conspicuous of all is the tendency to redness and bursal thickening over the inner aspect of the great toe and occasionally over the head of the fifth metatarsal. Occasionally these become infected and the bursa suppurates. The great toe may overlie the two adjoining toes in extreme cases.

Associated with these static disturbances in the great toe are to be noted corns and callosities on other toes which in themselves are painful and seriously impede locomotion.

In many cases the patient has observed that the anterior arches of the feet have spread, necessitating the purchase of wider shoes, and associated with this spreading has been the development of hallux valgus. The common explanation of this deformity is that it is caused by short shoes. That it is a shoe deformity I think there can be but little doubt; whether a short shoe is an adequate explanation or not is a matter of some doubt.

Most shoes, particularly women's shoes—and it is among women that this deformity is most common—narrow from a point about opposite the first metatarso-phalangeal articulation forward to the tip of the great toe. A similar curve is observed on the outer side of the foot from the fifth metatarso-phalangeal joint forward. There is a good deal of variation in the relative lengths of the phalanges, the metatarsals and even of the other tarsal bones. On the other hand, for a given length and width of foot a ready made shoe varies not at all in a given style in the distances from the points where the shoe begins to narrow toward the toes. If, therefore, the foot, from the point of view of the shoe-dealer, calls for an 8-D size, for example, it may well be that a person with abnormally long metatarsals may have the metatarso-phalangeal joint carried from a quarter to a half inch further forward in the shoe than the point where the shoe begins to narrow and yet the shorter phalanges may not carry the tip of the toe any further forward than is consistent with a well-fitting shoe, so far as length of foot and length of shoe are concerned.

Add to this the fact that the anterior arches

* Metcalf: BOSTON MED. AND SURG. JOUR., AUG. 29, 1912.

† Henderson: JOUR. A. M. A., OCT. 16, 1915.

† Metcalf, *loc. cit.*

in these individuals spread laterally and the thrust of the foot as one rises on the toes tends to crowd the "fore" foot toward the front of the shoe, where it is narrowest; you have factors operating which combine to produce this deformity and its accompanying static disturbances.

Now let us notice what one finds in the examination of these cases of hallux valgus and what one observes to be the pathological changes in the head of the bone when it is removed at operation. Also one needs to study the gross



FIG. 1. Note the position of the phalanx in reference to the metatarsal, as well as the displacement of the sesamoid. There is no trace of hypertrophy of the metatarsal head. A considerable portion of the articulating surface of the metatarsal head is never in contact with the phalanx.

anatomy of these cases both in the beginning and well-advanced types. To palpation and inspection there does not seem to be any gross osseous thickening over the head of the fifth metatarsal even in cases where there is marked deformity.

The x-ray examination does not reveal any appreciable thickening of the metatarsal or phalanges. Except where there have been some osteo-arthritis changes in the bone due to a diathesis, I have seldom observed any enlargement of the metatarsal heads. The conspicuous change which one notes in these specimens is an atrophy and oftentimes an erosion of the inner articulating surface of the metatarsal. It is this surface that is not apposed to the corresponding

articular surface on the phalanx and this lack of apposition results in the alterations of the bearing surfaces above mentioned. Figure 1 illustrates this very well, for the proximal end of the phalanx has slipped well off to the outer side of the distal end of the metatarsal and there is no enlargement of the end of the metatarsal. In some of the most pronounced cases that I have observed, when capacity for correction by forcible adduction of the great toe is still present, there is no undue prominence of the metatarsal head when the deformity has been corrected.

These facts, I think, pretty conclusively show that hallux valgus is not an exostosis of the metatarsal head or its articulating phalanx. If it is not this then it is merely a lateral deviation of the great toe at the outset, accompanied by stretching of the inner capsular attachments and later on by structural alterations of the articulating surfaces no longer in use, dependent upon lack of function.

If these premises are correct as to etiology, and anatomico-pathologic changes are as they have been stated and their cause is properly interpreted, their treatment should divide itself into two phases: First, where the deformity can be manually overcome, an attempt should be made to correct it by mechanical means, employing night splints to adduct the toe and a toe post in the shoe for day use. Manual stretching and proper shoes are also needed. One of the most extreme cases of this deformity kept the toe wholly correctible by daily forcible stretching. When the deformity was overcome there was not the slightest excrecence on the inner aspect of the metatarsal head.

The second phase requires operative treatment. If there is no exostosis then none of the operations contemplating the shaving off of a lateral sliver of bone from the metatarsal and phalanx are logical surgical procedures. The presence of an intermetatarsal is so rare that its removal as a cause of hallux valgus needs to be remembered only as an occasional necessity. Tendon transplantation is scarcely more worthy of serious consideration.

The operation that makes the strongest bid for first place is the old Hüller operation. The removal of the head of the metatarsal and preservation of the phalanx satisfies the demands of the probable anatomic cause referred to above when discussing the etiology, viz. the fact that the metatarsal may be too long. This operation shortens it and permits conformity to the ready-made last. It equalizes pressure in the metatarso-phalangeal joints by squaring up the unopposed articulating surfaces.

This procedure, when accompanied by resection of the bursa, when enlarged, meets all the anatomic and pathologic conditions presented by the situation and has only one objection raised against it: viz. that the chief buttress of the anterior arch is weakened by the

operation and occasionally this may be true, though in the majority of instances the functional results obtained after this operation are excellent.

To those who have had experience with the method of Hüter, the tendency of the phalanx to ride up after the removal of the metatarsal head is familiar. This results in leaving the toe out of contact with the floor when the patient stands. This may be avoided in most cases by using a metal splint after the operation, so designed that the proximal end of the phalanx is prevented from riding up by an arm that exerts pressure on it from above at the same time that a flange makes pressure against the outer side of the first phalanx of the great toe in such a direction as to keep the toe in a straight line with the long axis of the shaft of the metatarsal. This is made of German silver, can be sterilized and put on at the time of the operation and worn through the two weeks that weight bearing is not permitted, and longer if necessary. It is unreasonable to suppose that one can remove from the joint a piece of bone three-eighths to one-half inch in length without its being missed from the cavity of the articulation. Time must be allowed for the capsule to shrink down to fit the new situation and some restraint must be enforced upon the bones entering into the makeup of the joint so that cicatrization and contraction of the capsule may go on symmetrically and uninterruptedly.

After about four weeks' convalescence a patient with the Hüter operation can generally walk with a fair degree of comfort and will be permanently relieved.

There seems to be no flaw in the chain of evidence which places upon etiology and pathology the responsibility for the justification of surgical treatment by means of the simple procedure of Hüter. It is, in my opinion, unnecessary to complicate this operation by turning in the bursa between the end of the metatarsal and the adjoining phalanx. For the reason that the cause is frequently, if not always, an anomalous development of the tarsus and metatarsus it seems irrational to resort to wedge-shaped excisions of portions of the metatarsal which do not result in shortening the bone at all. The disturbance of the support of the anterior arch by a bone operation upon the first metatarsal head, which has constituted the one serious objection to Hüter's method and has led to the suggestion of some other procedures, may be obviated by the employment of a post-operative splint.

There is probably no surgical procedure practised which brings more comfort than that which relieves one who has suffered for long years from the discomforts of a hallux valgus.

THE CHOICE OF A CLIMATE IN CASES OF BRIGHT'S DISEASE AND NEPHRITIS.*

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Secretary, American Climatological and Clinical Association.

THE questions are frequently asked: "What climate is best for a person with Bright's disease or nephritis?" and "In what way, for better or worse, does climate affect the kidneys?"

In a general way the impression seems to be that damp and cold climates are unfavorable and that warm and dry climates are beneficial; and that is probable true. For the last ten years I have been more or less interested in collecting data bearing on this subject so that it could be definitely shown just what localities might be advised and why they are beneficial.

One way of approaching this subject is by a study of mortality records, comparing those of different localities. The first criticism of this method is that "the registration of deaths gives a very imperfect view of the prevalence of disease. . . . It is fallacious to assume any fixed ratio between sickness and mortality." This is particularly true of infectious diseases, but the relationship is a little closer for the diseases we are considering. In the absence of morbidity records we have to rely on mortality statistics, and, of course, choose those coming from communities where there is some adequate system of registration.

And right here we meet with various difficulties. One of the first concerns the estimate of population. It is well known that in some communities there is an overwhelming desire to overestimate population; this, of course, apparently lowers the death-rate, and in the absence of an accurate census it leads to irregularities in the ratios, independent of other factors in the case. In rapidly growing communities where the boom spirit prevails, this should not be lost sight of. Then, again, the nature of the population makes a great difference. The more settled communities have a larger proportion of people over 50 years of age; but where migration is a factor in adding to the population, it averages younger and chronic degenerative diseases are not so prevalent.

The occurrence of kidney disease doubtless has to do with personal habits, such as the use of alcohol, and with occupations such as mining, etc., with worry, hurried eating, especially of meats, and lack of exercise.

Without much intention to make a choice, excepting that the localities should be well distributed, I noted on three different years the combined mortality from Bright's disease and nephritis from statistics of twenty-five cities and obtained the following results, for which I am

* Read by title at the Thirty-first Annual meeting of the American Climatological and Clinical Association, San Francisco, June 18, 1915.

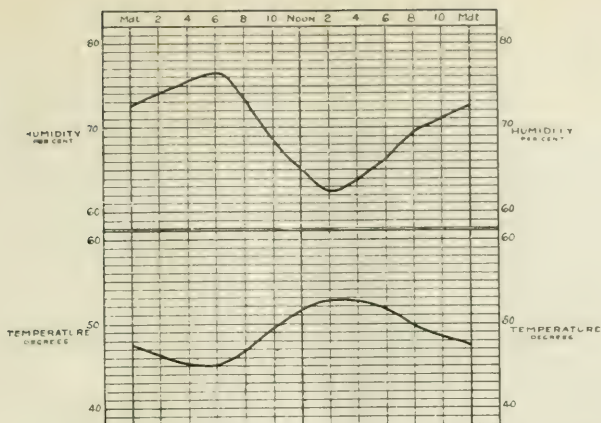


CHART I. Relative humidity (bi-hourly), Chicago, from May, 1911, to April, 1912, inclusive, showing inverse relation to temperature.

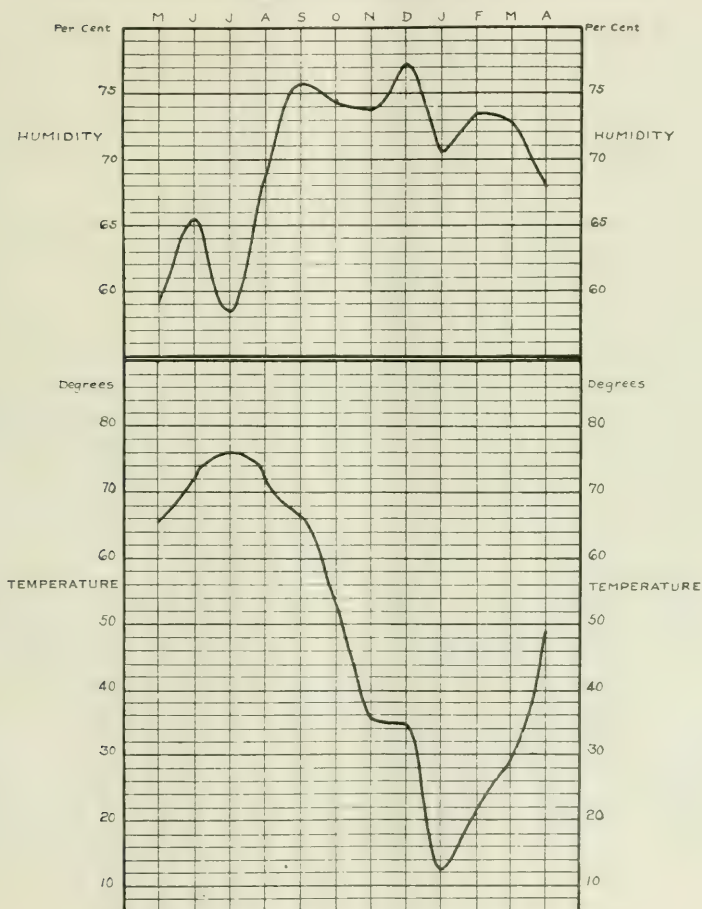


CHART II. Average relative humidity and temperature for Chicago, by months. Cox and Armington, "Weather and Climate of Chicago."

indebted to the various registrars of vital statistics.

I also obtained from the Chief of the United States Weather Bureau the relative humidity of the different stations as far as they were recorded. The average relative humidity is observed in the government service at all stations here given at what is known as 75th meridian time, or at 8 A.M. and 8 P.M. Washington time. This is necessary for the service, but in practice it calls for some observations at 8 A.M. and for others at one, two, or three hours earlier in the day, according as the station is situated, where eastern, central, mountain, or Pacific time is used. Two or three hours earlier in the morning tends to much higher records, and two or three hours earlier in the afternoon to lower humidity records, especially when the days are short.

The relative humidity, measured hour by hour, shows a wider diurnal variation than in the case of the temperature, as seen in the accompanying diagram for Chicago, which shows the inverse relation of the two curves.¹

It will be noted that the cities here listed have been arranged for our purpose in the order of mortality for 1914, beginning with the highest and closing with that of lowest mortality. Some interesting features are apparent. In the first place, there is no obvious relation between mortality statistics of these cities and the records of relative humidity as they are furnished. Another curious circumstance is that the mortality figures for Colorado Springs and Denver

are nearest to those of New York, San Francisco, and Boston. Here we have two famous localities in the high and dry air of the Rocky Mountain region no better off, apparently, as far as mortality from acute Bright's disease and nephritis is concerned, than Boston, New York, and San Francisco at sea level and subject to the characteristic climates of the Atlantic and Pacific seaboard. It seems to be true that Omaha, Nebraska, among the cities mentioned, has the lowest death-rate from the diseases we are considering.

Another note may be made, and that is that "the old order changeth," and that as years pass, few cities preserve a consistent position in the line.

Through the courtesy of the University of Chicago Press, I am able to show a chart illustrating the relative humidity by months in fifteen cities in the United States, arranged by Professors Cox and Armington. Now if we take the states that have adopted a system of registration, we find something more significant. In the accompanying table, taken from the United States Government mortality records, which I have arranged in the order of highest mortality for the year 1913, there is a decided grouping. The New England and Middle States, together with Maryland and North Carolina, fall in the upper division of high mortality, while the lower division of least mortality is almost exclusively made up from Central and Western States.

A glance at Table II shows at once that a low mortality from the causes we are consider-

TABLE I.—DEATHS FROM NEPHRITIS AND ACUTE BRIGHT'S DISEASE. RATE PER 100,000 LIVING.

	1904	1908	1914	PERCENTAGE OF RELATIVE HUMIDITY		
				8 a.m.	8 p.m.	Annual
Petersburg, Va. ...	243.0	302.6	320.0	—	—	—
Galveston, Texas ...	—	268.7	226.0	83	77	81
Ogdensburg, N. Y. ...	278.2	181.3	193.0	—	—	—
Albany, N. Y. ...	208.2	175.0	185.0	76	66	—
New Orleans ...	196.6	222.2	184.0	84	72	78
Baltimore ...	163.4	159.7	160.1	70	62	—
Philadelphia ...	160.0	159.7	153.5	75	65	—
Jacksonville, Fla. ...	200.0	195.3	142.5	81	73	80
Providence, R. I. ...	154.9	119.6	125.6	72	71	—
St. Joseph, Missouri ...	32.7	52.8	120.0	81	61	—
Newark, N. J. ...	140.0	122.7	114.2	—	—	—
Boston ...	79.6	89.4	110.0	72	70	—
San Francisco ...	123.2	75.0	109.0	86	69	80
Colorado Springs ...	80.0	75.9	106.0	—	—	—
Denver ...	114.3	136.7	102.2	67	43	51
New York City ...	174.5	145.7	101.0	70	61	73
San Antonio, Texas ...	82.0	124.5	90.0	86	58	—
Toledo, Ohio ...	67.0	69.1	89.0	78	68	—
Columbus, Ohio ...	54.0	78.3	84.8	80	65	—
Chicago ...	100.0	98.7	83.4	72	65	75
Portland, Oregon ...	58.0	73.8	69.0	—	—	87
St. Paul, Minn. ...	56.0	73.6	68.0	80	—	—
Pittsburgh, Pa. ...	55.0	66.7	65.6	74	61	—
Milwaukee, Wis. ...	58.5	64.4	63.7	76	70	—
Omaha, Neb. ...	64.1	50.3	55.3	78	60	70

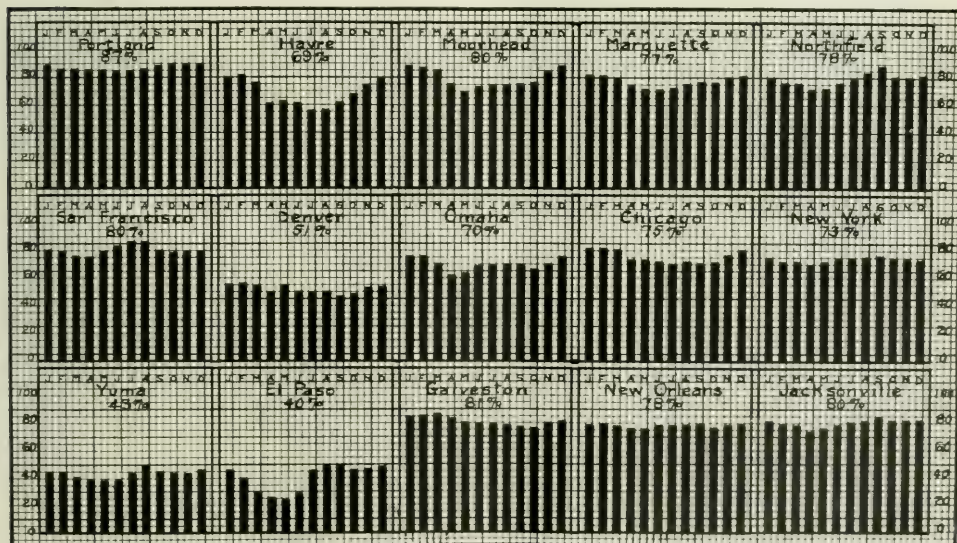
TABLE II.—DEATH RATE FROM NEPHRITIS AND BRIGHT'S DISEASE IN STATES PER 100,000 POPULATION.

	1913	1914
Maryland	130.4	140.1
New York	138.5	134.7
Rhode Island	123.6	123.9
New Jersey	117.1	121.8
New Hampshire	121.7	118.8
Vermont	115.7	115.6
Connecticut	106.3	112.0
North Carolina	106.0	103.1
Pennsylvania	94.4	103.0
Maine	101.4	102.7
California	95.3	98.7
Missouri	95.4	95.2
Virginia	—	93.9
Indiana	92.9	92.7
Ohio	90.1	87.0
Kentucky	75.4	80.3
Colorado	83.0	75.5
Michigan	75.4	74.9
Minnesota	70.6	72.5
Utah	60.6	64.7
Wisconsin	67.2	61.4
Montana	60.6	58.9
Washington	49.9	55.6

ing is not always associated with a low relative humidity, as in the case of Washington. Perhaps we may see in this table some solution to our problem.

Turning now to clinical evidence as to climatic influence on acute and chronic kidney diseases, we find some interesting observations which may lead to some practical conclusion. The most useful studies in this particular seem to have been made in Colorado and Texas.

Dr. Sewall has reviewed this whole subject in a careful paper which gives us some insight into the problems involved. Making his observations at Denver, elevation 5,280 feet, he has clinical evidence that cases of acute nephritis subside apparently as readily there as, judged by the literature, they might be expected to do at sea level; and that cases of chronic nephritis may apparently recover or continue to live in comfort for years.



Average annual and monthly relative humidity in per cent. for fifteen selected cities, 1889-1910. Cox and Armington.

Dr. Sewall calls attention to the fact that the solid tissues, fluids and gases throughout the body are under a certain tension, which exactly balances the pressure of the atmosphere upon the surface. "It would seem to follow that when one enters a pneumatic chamber in which the air pressure is lowered, or ascends from a lower to a higher altitude, there would be a movement of the labile (more movable) parts of the system from the interior towards the exterior. As has been said by others, it is as if the whole surface of the body, including the lungs and skin, were under a great cupping glass. There would be congestion of the skin through filling of the superficial vessels, and, presumably, determination of blood to the air passages and alveoli."

This cupping glass theory of the physiologic effect of diminished barometric pressure has a firm hold on the medical profession, but that it is erroneous for all ordinary conditions has been demonstrated. There is no doubt that with gradual ascent from a lower to a higher elevation, external and internal pressures keep equal pace.² The view of Haldane and his colleagues, founded on experiences on Pike's Peak, Colorado, that all the physiological phenomena peculiar to high altitudes are directly or indirectly the result of lowered oxygen tension in the air, must be depended upon to explain the facts.³

We all know that certain classes of persons, those who are rheumatic or gouty, are unpleasantly affected by a change in the weather. With the onset of bad weather, in other words, by a more or less marked fall in the barometric pressure, the onset of a cyclonic storm, the affected joints and muscles ache. Such persons are probably known to all of us and naturally excite our sympathy. Men who worked in caissons under abnormally high atmospheric pressure, measuring as much as thirty-eight or forty pounds to the square inch, in the railroad tunnels under the Hudson River and East River, suffered these pains in a marked degree. Hence unusual precautions were taken in restoring them to the usual atmospheric pressure. By means of a series of air "locks" during the period of decompression, an equilibrium is gradually restored.

A fall of barometric pressure, as Dr. Sewall shows, can produce painful sensations in three ways: (1) The mere mechanical redistribution of the body fluids may excite, like a movement of massage, the nerve filaments—made abnormally sensitive by a chronic inflammation; (2) the accumulation on the surface of blood containing an excess of intermediary (poisonous) metabolites may, as in gout, cause precipitation of irritative matters in the muscles or connective tissues; (3) the circulatory changes in the metabolic organs, particularly the liver, may so interfere with their oxidative powers as to lead to the abnormal accumulation of the products of intermediary metabolism.

As has been mentioned previously, when atmospheric pressure is lowered, the venous system becomes engorged and the venous blood-pressure becomes abnormally high; and this seems to be true of the class of cases we have been considering.

Temperature Changes.—We know that a fall of temperature makes the peripheral blood-vessels contract, with a corresponding dilation of the deeper vessels. Relaxation of the superficial vessels is by no means so prompt as their contraction, and in cold weather active measures, such as friction and massage, may be required to overcome the stasis of the blood and lymph. Thus we see that the effect on the kidneys of a fall of temperature is to increase the volume of blood in the kidneys and to promote a rise of arterial tension by increasing the velocity of the blood flowing through them (and in all the deep-seated viscera) to increase their excretory activity and output.⁴

The associated cutaneous anemia decreases the sweat and, as a consequence, the watery excretion of the skin devolves for the time being upon the kidneys, lungs, and intestines, and chiefly, as far as evidence goes, on the kidneys. Generally speaking, temperature rise produces the opposite effect of temperature fall, though not so quickly.

We know that when the bodily surface is exposed to cold the oxidizing capacity in the tissues thus cooled is lowered. When the extensive skin envelope is deprived to some extent of its oxidizing capacity by cold the body falls back on its heat regulating apparatus to maintain its proper metabolism and a constant normal temperature of the blood. Increased oxidative capacity is, therefore, necessary elsewhere than at the periphery. It has been determined that a bath in water at 61° F. increases the oxygen absorption 47%, while douches at this temperature cause an increase of oxygen absorption of about 110%. This remarkable counter-effect is brought about by the heat regulating mechanism. Metabolism is greatly stimulated by cold applications, especially when accompanied by active or passive exercise.

By analogy we may reasonably conclude that the same stimulus to the metabolic processes takes place in the presence of cold air as it does under the stimulus of cold-water applications. and, provided an adequate reaction occurs and the general circulation is maintained and the kidneys are unimpaired, the normal tissue changes go on in an uninterrupted and normal manner. When the available oxygen supply is large the increased metabolism is automatically and physiologically maintained.

It has been observed that the great majority of cases of uremia occur in cold weather, and this would bear out the conclusion that faulty oxidation, which is primarily lowered by cold, is an important agent in causing uremia, the kidneys in that case, as well as the heat regulat-

ing apparatus, not being in a normal state of efficiency.⁵ The primary cause of uremia is a deficient oxidation of protein derivatives and the danger is in proportion to incompletely oxidized protein derivatives in the urine.

Atmospheric Humidity.—The influence of atmospheric humidity upon the functions of the kidney is through its effect in promoting or retarding cutaneous and respiratory evaporation. With respect to the skin, evaporation from a moist surface depends, in a quiescent air, on the relative humidity. The nearer the point of saturation the slower the rate of evaporation, and the greater the deficit of saturation (low humidity) the more rapid the rate. So that in any given case the actual amount of water that may be evaporated will depend upon the temperature and on the wind movement. We see at once the great necessity of proper clothing that evaporation may not go on too rapidly. Professor Phillips states that in a quiet atmosphere at 30° F. and 80% relative humidity, a cubic foot of air could receive but .038 of a grain of water more before becoming saturated; whereas at a temperature of 80° F. and the same relative humidity in the same time, a cubic foot of air could take up .219 of a grain, or about six times as much.

Wind.—There is yet one important element of climate that must be considered in this connection and that is wind. In connection with temperature and humidity, wind assumes a great importance when we consider the extent of our skin covering.

Now the wind, as we know, intensifies the action of temperature change. When, as is usually the case, the atmospheric temperature is lower than that of the body, the greater the velocity of the wind the greater the loss of heat, other conditions being equal. Cold winds can lower the temperature of the skin or of the body itself, as any of us can easily verify. If it is so in health, how much greater will be its effect when the body and its internal organs are diseased. And when we consider that in such subjects imperfect metabolic products are liable to accumulate in the tissues as a result, or as a concomitant, of the blood lymph stasis already mentioned, we can understand that these effete products when thrown into the blood, upon restoration of normal circulation, may act as irritants to the kidney cells.

Soil.—Undoubtedly the character of the soil has much to do with the prevalence of nephritis just as in the prevalence of phthisis. A cold, damp, clayey soil, with sudden variations of temperature, is likely to chill the feet, and this co-operates with the bad effects of intemperance, overwork, and errors of diet which set on foot nephritis.

It is important to bear in mind that there is a distinctive difference between the false albuminuria of a cystitis or pyelitis and the true albuminuria of a nephritis. In Arizona, espe-

cially during the hotter season, it is not uncommon for persons to urinate only once or twice a day. The urine becomes concentrated and cystitis of a mild grade ensues and is followed by an increased desire to pass urine, though the quantity is small. The bodyweight is reduced in the arid regions. Dr. Thomas Darlington, who formerly practised medicine in Arizona, ascertained that among fifty-eight persons of whom inquiry was made, only one had gained weight. Hence we see the improbability of persons with wasting diseases gaining weight in such a desiccating climate.

The southern portion of Arizona, which has a much more moderate altitude than the northern portion, southern California, or almost any part of the great interior valley of California, are desirable localities for persons with Bright's disease. So, also, are the interior stations in the Pacific slope and the Great Plains, including Nebraska, Montana, Colorado, and Utah.

One of the most brilliant examples of recovery from chronic kidney disease known to the writer followed removal from an eastern city to San Diego, California. After a few years perfect health resulted and a most useful life was spared. It is now thirty years since, as an invalid, he left his eastern home, full of anxiety as to the future, which had in store for him only the richest reward.

San Diego has been said to have "the driest marine climate." It is a cool moist climate with much sunshine. The mean annual relative humidity is 75%, varying from 67% in December to 80% in July and August.

Altitude.—Nephritis is not influenced unfavorably by high altitude. A great many cases of nephritis do remarkably well in Western Texas, in New Mexico, and along the slope of the Rocky Mountains, at five or six thousand feet elevation. Others do very badly.

In a recent communication from Dr. Edward C. Hill, of Denver, who has made many thousand urinary analyses during a long residence in that city, the opinion is expressed that true renal albuminuria is comparatively rare in Colorado, passive congestion from heart weakness and dilation being far more common. Personally he has observed but a small number of cases of nephritis which could be directly attributed to alcohol. He states that acute nephritis, though not commonly observed, is exceptionally severe; chronic parenchymatous nephritis appears to terminate fatally in about the same time as at lower altitudes. The chronic interstitial type of the disease, on the other hand, is influenced favorably by this climate, and he attributes this to its tonic invigorating qualities. Slight transient, circulatory albuminuria, due chiefly to high blood-pressure, is frequent in Denver. Of heterotoxic forms of albuminuria, that due to metallic poisons is seen rather frequently among the miners and about the smelters.⁶

About ten or twelve years ago Dr. Wm. S. Carter,⁷ Professor of Physiology in Galveston, Texas, made comparative observations at Boulder, Colorado, and Galveston, Texas, in an effort to ascertain what relationship, if any, exists between the temperature and humidity of these localities and the occurrence of Bright's disease.

Carter approached this subject by a series of experiments and observations on the consumption and elimination of water in these two localities. Galveston is at sea level with a warm and moist climate; Boulder has an elevation of 5,400 feet (1,636 metres), and its climate is much dryer and cooler. The observations at Boulder were in July, 1899; those at Galveston were in the following September, and in the same month in 1903. The experiments were first made upon himself. By a strange coincidence the average output of urine in the six days in Boulder and in the nine days in Galveston, 1899, was exactly the same, viz. 1,404 c.c. daily. The average amount of water taken at Galveston was 2,140 c.c., and at Boulder 1,940 c.c. The temperature was rather cool for Galveston, but somewhat warmer than in the days at Boulder. Observations were also carried out at San Antonio, Texas, as well as at Galveston, on four individuals. The results showed that the average daily consumption of fluid was approximately 400 c.c. greater at Galveston than at San Antonio, 225 miles from the coast, and 700 feet above sea level, with a somewhat greater diurnal range of temperature and considerably lower relative humidity.

It is impossible to relate all the details of this excellent study, but it was evident in this, as in other similar climatic studies, that one takes more fluid as drink in a moist climate and passes less urine than in a dry climate. Dr. Carter remarks that the amount of moisture given off by the skin and the lungs in dry climates is not so great as is often thought. The sensible perspiration which results from the effort at heat regulation on the part of the animal economy in a hot moist climate probably accounts for this difference. Dr. Carter was unable, in view of the statistics which were then available to show any relation between Bright's disease and nephritis and relative humidity of the air.

CONCLUSION.

Bright's disease and nephritis are diseases clearly amenable to climatic treatment. Apparently the first requisite is that the air and soil shall be warm, sunny, reasonably dry and free from malaria and disagreeable atmospheric changes. It is a disease attended by extensive degenerative changes in the renal and circulatory organs, and hence it is highly necessary to insure an abundant and undisturbed action of the skin. The locality should be conducive to an out-of-door life the year round. This is the

well-known advantage of the climate of southern California, where the little rain that falls never does anyone any harm.

Our best course is to advise a warm climate first—one having moderate elevation and only a moderate rainfall, with small diurnal variations in temperature, the humidity being, perhaps, secondary in importance to temperature and wind.

The fact that other localities in the extreme north-west, such as the states of Washington and Montana, as well as Colorado, Minnesota, Wisconsin, Michigan, and Utah have such diverse climates, and, nevertheless, fall on the favored group, should not determine their choice as health resorts for renal cases, but would indicate some advantage in the character of the population and that the sum total of the elements of climate in those localities is conducive to a hardy race.

REFERENCES.

- ¹ "Weather and Climate of Chicago," Cox and Armington. Courtesy of Chicago University Press.
- ² Cf. Leonard Hill in "Recent and Further Advances in Biological Science."
- ³ Philosophical Transactions, Royal Society.
- ⁴ For this and subsequent notes on the action of wind, temperature and humidity I am indebted to the excellent paper by Professor W. F. R. Phillips, of Charleston, S. C., in the *Transactions of the American Climatological Association*, 1906.
- ⁵ See Ditman and Walker, *New York Medical Journal*, May 15, 22, 29, June 5, 1909.
- ⁶ *Jour. Amer. Medical Association*, 1905, p. 1173.
- ⁷ *Medical News*, November 12, 1904.

THE PITUITARY BODY AND RENAL FUNCTION.*

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DIABETES INSIPIDUS is a relatively infrequent disease, the etiology of which, until a recent date, was unknown. It has, however, been considered as connected with cerebral or cranial pathological conditions.

A sharp distinction has been sought to be established between primary polyuresis (genuine diabetes insipidus), and primary polydipsia, based on functional kidney examinations (Tallquist, 1903, and Meyer, 1905).

From Claude Bernard's celebrated *piqûre* (1854) resulted, as is well known, not only glycosuria, but also polyuria. Krause in 1894 presented thirty-four cases of bitemporal hemianopsia, of which seven had diabetes insipidus. Spanboch and Steinhaus demonstrated seven cases of diabetes insipidus in a similar collection of fifty patients.

To the studies and observations which have further induced the thought of the pituitary body should be accredited the name of Schäffer of Edinburgh, who investigated the

* A previous communication on this subject has been made under the title "Hypolyse of diuresis" in *Norsk Magas. f. lægevid.*, 1915, Nr. 11.

effects of the hypophysis extracts. In 1901 Magnus and Schäfer demonstrated an increased diuresis in animals treated with intravenous injections of hypophysis extract, which subsequently had been regarded as the "physiological diuretic." Schäfer and Herring demonstrated in 1906 that its effect was dependent on the *pars intermedia*.

A direct connection between diabetes insipidus and the pituitary body was first pointed out clinically by Frank (1912). During the last few years a number of similar communications have been received from Simmonds, Berblinger, Goldzieher, Steiger, Benario and Borelli.

At the end of 1913 a new light was thrown on the subject by von den Velden and Farni, who maintained that the cause of diabetes insipidus is to be sought in an impaired function or lack of function of the pituitary body. Their opinion was corroborated by Roemer's experiments on rabbits. Similar experiences have since been published, amongst others, by Simmonds, Stromeyer, Hohlweg, Umber, Biach, v. Konsensegg and Schuster, Groul and Grondahl.

Cushing found that as a rule polyuria appeared consequent on removal of the hypophysis in human beings as well as in animals.

In experimental work on dogs, Lewis and Mathews in 1913 were able to demonstrate polyuria if *pars intermedia* were removed or injured.

I will now proceed to present the material I have had an opportunity of examining which bears on these questions.

CASE 1. Woman, 42 years of age. Had always been well except for measles, mumps, erysipelas, and otitis media. About Christmas time, 1913, she felt lassitude and subjective symptoms of hemianopsia, which, however, could not be confirmed by the oculist. In the course of three months these symptoms disappeared and have not recurred. In February, 1913, her thirst increased and the diuresis amounted to about 10 liters *per diem*. At the onset

of the disease menstruation ceased. During the first few months she lost 10 kilograms in weight, but regained the same and more later on, so that after six months she weighed 10 kilograms more than at the onset of the disease. Wassermann negative. Roentgenogram showed a normal cranium. The diaphoresis was markedly lowered. Field of vision normal. Skin dry, with faint brownish pigmentation. Blood examination showed some lymphocytosis, but no increase of eosinophils. The subcutaneous fat was abundant, especially on abdomen and hips. The thyroid gland was not enlarged. Urine: sp. gr. 1.004. Albumen and sugar negative. Blood pressure (Riva Rocci) 110.

TABLE I.—URINE OF PATIENT, CASE 1.

Hour.	Quantity (cc.)	Sp. Gr.	Chloride %
7-9 A.M.	100	1.005	0.5
9-11	350	1.004	0.5
11-1	950	1.005	2.0
1-3 P.M.	1000	1.006	2.5
3-5	800	1.006	2.0
5-7	800	1.005	1.0
7-9	600	1.005	1.0
9-11	300	1.004	0.5
11-1	500	1.002	0.5

Obs. At 12 o'clock the patient was given 10 gm. sodium chloride.

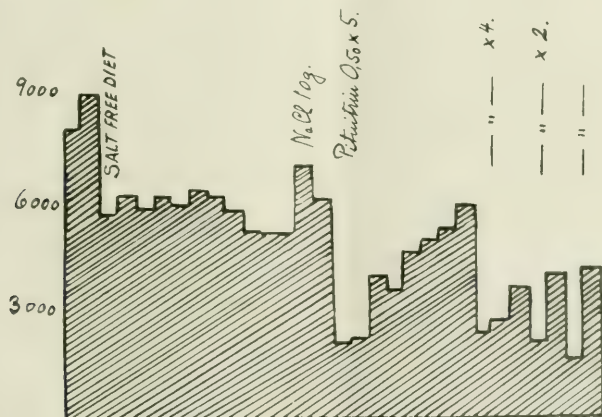
Thirst Experiment: (3 hours.) After this limit of time the patient began to feel uncomfortable.

URINE.			
BEFORE.		AFTER.	
Sp. Gr.	NaCl %	Sp. Gr.	NaCl %
1.004	0.5	1.005	0.5

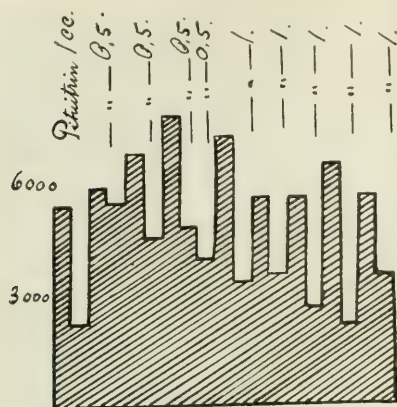
Freezing point depression in the blood:

Before..... 0.56° After..... 0.58°

Carbohydrate tolerance: levulose 250 gm., negative. Was treated with pituitary extract. The diuresis diminished promptly, but increased again the following day, as will be seen in the accompanying charts.



CASE 1.—Diuresis. Oct. 11 to Nov. 9, 1914.



CASE 1.—Diuresis, influenced by pituitrin, when the patient was up and about, following her regular vocation. Dec. 9-27.

TABLE II.

CONCENTRATING EFFECT OF PITUITARY EXTRACT.

Time.	Quant. of Urine cc.	Sp. Gr.	Chlorids. %	Remarks.
Oct. 26				
7-9 A.M.	500	1.004	0.5	11 A.M. pit. ext. 0.5 c.c. subcu.
9-11	500	1.005	0.5	1 P.M. pit. ext. 0.5 c.c. subcu.
11-1	370	1.014	4.0	3 P.M. pit. ext. 0.5 c.c. subcu.
1-3 P.M.	80	1.015	4.0	5 P.M. pit. ext. 0.5 c.c. subcu.
3-5	70	1.014	4.0	7 P.M. pit. ext. 0.5 c.c. subcu.
5-7	90	1.014	4.0	
7-9	30	1.017	4.0	
9-11	150	1.014	3.0	
1-3 A.M.	90	1.015	2.5	
3-7	270	1.014	2.5	The chlorids
7-9	120	1.015	2.5	were determined
Oct. 27				according to
9-11 A.M.	230	1.014	2.0	Archard-
11-1	180	1.013	2.0	Thomas
1-3 P.M.	240	1.010	1.0	method.
3-5	160	1.008	0.5	
5-7	200	1.007	0.5	
7-9	250	1.007	0.5	
9-11	250	1.006	0.5	

She was then for a considerable period given pituitrin subcutaneously, and later, by the mouth, entire, fresh pituitary bodies (from the ox). She took seven every night. She slept all night without interruption and voided in the morning 300 to 400 c.c. of urine. During the same period her weight was reduced by about 1 kilogram. The sensation of lassitude disappeared and menstruation was re-established. The pituitrin, however, had apparently no effect on the nitrogen excretion as determined by Kjeldahl's method.

Feeding the patient with the posterior lobe of the pituitary body checked the diuresis, while administration of the anterior lobe had no such effect.

The other treatment given, with the exception of opium, had no effect. As the concentration of the urine remained unchanged after opium, the effect must be supposed to depend on the thirst.

CASE 2. Woman, 23 years of age. The patient had had measles, scarlet fever, and whooping cough. When about six years old she received a trauma on the head and has since been "odd" and very nervous. In 1902 she had chickenpox, and four or five days after its onset she commenced to be very thirsty. Diuresis, 6 to 9 liters *per diem*. The hospital treatment seemed of little avail. In 1909 she had typhoid fever. Menstruation was delayed, commenced when she was about 18, and has remained scanty and irregular. The patient was undersized and thin; looked almost infantile. Weight, 46 kg. Urine: sp. gr., 1.005; albumen and sugar negative. By giving 20 gm. sodium chlorid the diuresis rose from 8000 to 11,600 c.c., while the sodium chlorid concentration increased from 0.25 to 0.51%.

TABLE III.

SHOWING SODIUM CHLORID CONCENTRATION IN URINE. THIRST EXPERIMENT.

Hour.	Quantity.	Sp. Gr.	NaCl. %
7-9 A.M.	250	1.005	1.4
9-11	200	1.005	4.2
10-11	150	1.005	3.9
11-12	75	1.0075	6.0

Except for a short systolic murmur, nothing abnormal could be elicited on physical examination. Roentgen ray picture showed a normal cranium. Field of vision normal. Wassermann negative. She perspired easily.

On subcutaneous administration of pituitary gland extract (posterior lobe) the diuresis diminished to normal and remained so for twenty-four hours. She slept quietly all through the night, the first time since the disease commenced ten years previously. She experienced no sensations from the injection.

TABLE IV.

THE URINE IN CASE 2 AFTER ADMINISTRATION OF PITUITARY.

	Sp. Gr.	Chlorids %	Nitrogen %
5 P.M. (Before injection)	1.004	1.	1.41
5.15 Injection			
9 P.M.	1.016	3.5	4.77
8 A.M. (Next Day)	1.011	1.5	3.75

Albumen negative. Sugar negative.

The quantity was not measured because the patient was up and about, following her regular vocation. The patient has just recently commenced to take fresh hypophysis from the ox. Four posterior lobes of the pituitary body taken in the evening proved to be sufficient to diminish the output of urine to such an extent that she could sleep comfortably every night.

CASE 3. Woman, 39 years old. She had syphilis eight years ago and during the last four years had cerebrospinal symptoms of the disease. For the last six months she has suffered from diabetes insipidus, voiding from seven to ten liters of urine *per diem*. (Sp. gr., 1.002-1.003.)

X-ray picture of the skull revealed nothing abnormal, and the field of vision was also normal.

She had cystitis, was dull and uncleanly, and the urine was partly voided in bed.

Carbohydrate tolerance:

Levulose 200 grams: negative.
Levulose 300 grams: vomiting.

Thirst Experiment of Three Hours' Duration. %/100

Before:	Sp. gr. 1.004	Nitrogen (Kjeldahl) 1.68
After:	Sp. gr. 1.004	Nitrogen (Kjeldahl) 1.69

The diuresis went down from 6000 to 1500 c.c., and the sp. gr. increased from 1.003 to 1.007 upon subcutaneous administration of pituitrin (1 c.c. x 3). The same effect was achieved after two pituitrin injections, while extracts from the anterior lobe of the pituitary body (2 c.c., Parke, Davis & Co.) had no such effect.

Considering these three cases, it seems evident that we have before us "genuine" diabetes insipidus, dependent upon a weakness in or a relative insufficiency of the concentration capacity of the kidneys.

The symptoms pointing towards an ailment in connection with the hypophysis are more variable. In Case 1 we find more of a hypophysial adiposity, while in Case 2 we encounter a condition much resembling the hypophysial infantile state. (Lorain's Type.) As the roentgenograms of the craniums revealed nothing abnormal, and the field of vision in all three cases was normal, it seems unreasonable to suppose an enlargement of the pituitary body. No symptoms justifying the assumption, that we had to deal with a tumor of the hypophysis, were present. Nothing definite as to the anatomical character of the hypophysial diseases can be asserted.

The next question to be answered is whether a hyper- or hypo-functional activity has been caused by disease of the hypophysis. Nothing favoring the hyperfunctional activity theory as a cause of this ailment is present. To throw some light on the symptomatology of the hypofunction, I will relate what Cushing considers to be the cardinal symptoms:

1. High carbohydrate tolerance.
2. Subnormal temperature, slow pulse and low blood pressure.
3. Drowsiness.
4. Asthenia.

As to the first point, a levulose tolerance of 250 and 200, respectively (Cases 1 and 3), must be considered greatly increased. The tolerance was not tested in Case 2.

As regards point 2, my three patients do not meet the conditions set forth by Cushing; they occur to me to be rather exacting, but as regards points 3 and 4, my three cases have all fulfilled these, viz., manifested symptoms of dullness, sleepiness and asthenia.

Subcutaneous administration of extract from the posterior lobe of the hypophysis caused considerable diminution in quantity and increased the concentration of the urine, while administration of the anterior lobe (in Case 1 with fresh gland, in Case 3 with injection of the extract) had no such effect. I, therefore, wish to emphasize that these cases are due to a lowered functional activity of the posterior lobe of the pituitary body (the *pars intermedia* respect).

When we further take into consideration the fact that, although the disease is comparatively

infrequent, a number of cases have been recorded during recent years and their connection with the hypophysis has been proved beyond doubt, and inasmuch as no case has been published disproving such connection, I feel justified in asserting that the majority of diabetes insipidus cases are due to a lowered functional activity of the posterior lobe of the pituitary body.

Since Magnus and Schäfer's work (1901), there was, until the last few years, agreement on the point that the diuresis is increased on the administration of pituitary extracts, and this opinion was given in most text books as an assured fact. Experiments made on animals by Hallion and Carrion, Falta, Herring, Hoskin and Means, Pentimalli and Quercia, Thompson and Johnson, Roemer, Beco and Plumier have, however, led to divergent results. Injections made on human beings have been infrequent, and the experience gained limited. Falta found that the diuresis became increased, while von den Velden, Frey and Kumpies found that the diuresis diminished. Beco, who made injections in a number of patients suffering from heart disease, found, as a rule, no effect on the diuresis except in a few cases, where he noted a considerable decrease.

This question still being unsolved, and as it is of fundamental importance for the understanding of the genesis of diabetes insipidus, I have endeavored to inquire into the matter. The results may be seen in the accompanying charts.

TABLES OF TESTS.

TABLE I.

Man, 29 years old.

Diagnosis: Diarrhea chronica. Fistula ani.

Day.	Diuresis.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
Nov. 25	1300	1021	8	11.15	14.5	
" 26	1250	1021	7	10.58	13.2	
" 27	1200	1020	7	11.41	13.7	
" 28	1100	1022	8	11.71	12.8	Pituitrin*
" 29	1200	1020	7	11.52	13.8	0.50 ccm. x 4

TABLE II.

Man, 66 years old.

Diagnosis: Constipation.

Day.	Diuresis.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
Dec. 18	1700	1012	5.5	6.86	11.7	
" 19	1800	1010	4	6.64	12.9	
" 20	1800	1011	4	7.28	13.1	
" 21	1100	1021	6	11.20	12.3	Pituitrin
" 22	2050	1010	2.5	7.01	14.3	1 ccm. x 3

TABLE III.

Man, 28 years old.

Diagnosis: Cephalalgia.

Day.	Diuresis.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
Feb. 10	1800	1015	7.0	10.6	19.0	
" 11	1400	1021	8.0	14.1	19.7	
" 12	1200	1020	6.0	15.1	18.1	
" 13	1500	1016	4.5	12.7	19.1	
" 14	1600	1015	3.5	9.8	15.7	
" 15	1200	1019	5	13.2	15.8	Pituitrin
" 16	1450	1015	4	11.2	16.2	1 ccm. x 3

The above arrangement being found inconvenient to the patients, two-hourly records were introduced.

* Subcutaneously, as in every one of the following experiments.

TABLE IV.

Man, 55 years of age.

Diagnosis: Neurosis traumatica.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
8-10	550	1006	6	3.48	1.91	
10-12	450	1008	6	3.92	1.76	
12-2	550	1007	6	3.64	2.00	
2-4	525	1007	5	3.36	1.76	
4-6	225	1013	8	5.18	1.16	At 4 o'clock
6-8	120	1017	12	7.84	0.94	Pituitrin 1 ccm. x 3.

TABLE V.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	Urea (Hypobromide Method). %/100	N. %/100	Gr.	Remarks.
8-10	285	1010	8	2.0	0.57	
10-12	240	1011	9	3.1	0.74	
12-2	130	1016	13	4.4	0.57	At 12 o'clock
2-4	90	1018	14	6.4	0.58	Pituitrin 1 ccm.
4-6	160	1014	11	4.5	0.72	
6-8	140	1015	10	5.6	0.78	
8-10	235	1008	6	3.8	0.89	

TABLE VI.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
7-9	220	1011	6	5.2	1.21	
9-11	285	1010	5	5.0	1.42	
11-1	240	1012	6	5.1	1.22	
1-3	145	1015	7	5.5	0.79	At 1 o'clock
3-5	130	1016	8	6.1	0.79	vaporal-infundin
5-7	130	1019	7	8.4	1.09	(Burroughs
7-9	120	1020	9	8.9	1.06	Wellcome) 1 ccm.
9-11	100	1021	9	10.6	1.06	

TABLE VII.

Woman, 18 years of age.

Diagnosis: Ulcus ventriculi.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
7-9	375	1007	3.0			
9-11	390	1007	2.5	3.72	1.45	
11-1	395	1008	2.5	3.61	1.32	
1-3	460	1005	2.0	3.20	1.47	
3-5	250	1009	4.0	5.88	1.47	
5-7	110	1018	8.0	10.50	1.15	At 5 o'clock
7-9	74	1024	6.0	15.20	1.18	Pituitrin 1 ccm

TABLE VIII.

Woman, 31 years old.

Diagnosis: Adipositas dolorosa (Dercum).

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
7-9	230	1011	6			
9-11	355	1010	5			
11-1	225	1013	7			
1-3	160	1016	10			At 1 o'clock
3-5	125	1018	11			Pituitrin 1 cc.
5-7	230	1012	6			
7-9	180	1015	7			

TABLE IX.

Man, 23 years of age.

Diagnosis: Lumbago traumatica.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
8-10	70	1025	10	18.2	1.26	
6-8	160	1019	9	9.1	1.46	
10-12	180	1018	8	7.8	1.41	
12-2	135	1020	10	7.9	1.07	At 12 o'clock
2-4	210	1012	6	7.5	1.57	Pituitrin 2 cc.
4-6	340	1010	4	4.0	1.66	
6-8	260	1011	5	5.6	1.46	

TABLE X.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
6-8	100	1020	15	8.99	0.90	
8-10	280	1014	10	4.48	1.25	
10-12	240	1013	10	5.40	1.29	
12-2	115	1018	15	6.52	0.75	At 12 o'clock
2-4	135	1017	11	8.68	1.17	Pituitrin 1 cc.
4-6	225	1012	8	5.93	1.33	
6-8	350	1008	4	3.67	1.28	

TABLE XI.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
6-8	170	1022	11			
8-10	185	1020	10			
10-12	225	1017	8			
12-2	300	1014	7			
2-4	230	1015	8			At 2 o'clock
4-6	135	1020	10			Vaporal-infundin
6-8	175	1017	9			0.5 cc.
8-10	180	1017	8			

TABLE XII.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
6-8	60	1022	9	13.27	0.79	
8-10	145	1018	10	8.93	1.16	
10-12	200	1012	6	5.09	1.32	
12-2	200	1008	4	4.39	1.27	At 2 o'clock
2-4	120	1022	11	8.17	0.98	Pituitrin 1 cc.
4-6	305	1009	4	5.04	1.54	and adrenalin
6-8	210	1012	6	6.16	1.29	1 cc. simultaneously

TABLE XIII.

Man, 26 years old.

Diagnosis: Pneumonia (reconvalescentia.)

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
5-7	45	1030	11	21.16	0.95	
7-9	115	1026	15	14.69	1.69	
9-11	125	1024	14	12.26	1.53	
11-1	100	1025	15	14.82	1.73	
1-3	155	1022	11	11.20	1.73	
3-5	200	1017	9	8.73	1.75	

Control experiment.

TABLE XIV.

Man, 57 years of age.

Diagnosis: Ulcus ventriculi.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
5-7	135	1015	7	11.20	1.51	
7-9	145	1016	9	11.20	1.62	
9-11	360	1008	5	5.23	1.88	
11-1	180	1011	6	6.35	1.14	
1-3	125	1018	10	8.68	1.08	At 1 o'clock
3-5	125	1020	10	11.11	1.39	Pituitrin 2 cc.
5-7	155	1015	8	9.38	1.45	
7-9	230	1010	5	5.93	1.36	

TABLE XV.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100	N. %/100	Gr.	Remarks.
9-11	140	1015	7.0	9.01	1.26	
11-1	150	1014	6.0	9.04	1.36	
1-3	160	1012	4.0	7.76	1.24	
3-5	170	1012	4.0	6.84	1.16	
5-7	140	1014	5.0	9.85	1.38	
7-9	185	1011	3.5			

Control experiment.

TABLE XVI.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.	N. %/100.	Gr.	Remarks.
5-7	50	1025	1.0	17.44	0.87	
7-9	95	1021	1.5	18.34	1.74	
9-11	100	1020	2.5	16.43	1.64	
11-1	70	1022	3.0	16.88	1.18	
1-3	95	1019	1.5	17.78	1.68	At 1 o'clock extract of the anterior lobe (Parke, Davis) 1 cc.
3-5	90	1020	2.5	17.02	1.53	
5-7	75	1021	1.5	15.59	1.17	

TABLE XVII.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.	N. %/100.	Gr.	Remarks.
5-7	50	1028	4	18.30	0.94	
7-9	75	1025	8	16.80	1.26	
9-11	125	1020	7	12.46	1.56	
11-1	95	1023	7	15.10	1.43	
1-3	45	1028	9	16.94	0.76	At 1 o'clock Pituitrin 1 cc. and adrenalin 0.5 cc.
3-5	65	1026	7	17.69	1.15	
5-7	105	1021	6	12.88	1.35	

TABLE XVIII.

Woman, 24 years old.
Diagnosis: Dyspepsia.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.	N. %/100.	Gr.	Remarks.
6-8	90	1023	10	11.05	0.99	
8-10	200	1014	7	4.39	0.88	
10-12	130	1016	9	7.39	0.96	
12-2	130	1015	7	6.24	0.81	
2-4	65	1026	10	10.24	0.67	At 2 o'clock Pituitrin 1 cc.
4-6	80	1024	8	13.30	1.06	
6-8	230	1009	3	5.90	1.35	

TABLE XIX.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.	N. %/100.	Gr.	Remarks.
6-8	90	1020	7.0	9.24	0.83	
8-10	155	1010	5.0	5.70	0.83	
10-12	120	1014	8.0	7.84	0.94	
12-2	90	1018	9.0	9.80	0.88	
2-4	320	1008	4.0	3.63	1.16	At 2 o'clock extract of the anterior lobe. (Parke, Davis) 1 cc.
4-6	200	1009	4.5	4.70	0.94	
6-8	90	1019	7.0	10.02	0.90	

TABLE XX.

Man, 48 years old.
Diagnosis: Vit. cordis. Lues.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.
6-8	85	1023	9
8-10	105	1020	9
10-12	95	1021	8
12-2	85	1021	8
2-4	85	1020	7
4-6	100	1020	7

Control experiment.

TABLE XXI.

Man, 52 years old.
Diagnosis: Reconvalescentia. Pleuritis.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl. %/100.
6-8	125	1021	8
8-10	140	1019	7
10-12	120	1020	8
12-2	145	1018	7
2-4	130	1017	6
4-6	120	1018	7

Control experiment.

As will be seen from the tables, the first three experiments were carried out in periods of 24 hours each. When the patients had been on a constant food-ratio for a few days, the diuresis became proportionate to the ingested material.

This arrangement, however, was inconvenient for the patients and consumed a great deal of time. I, therefore, commenced to use two-hour periods, which, although less reliable than the 24-hour tests, still proved to be serviceable. After three or four tests of two hours each, in which the patient received a fixed supply, the diuresis, if not absolutely constant, at least varied to such a slight degree, that a decided difference in one or another direction would easily have been observed. Of course, the food and liquid supply given the patient the day previous to the experiment had a determining influence. If, for instance, full diet had been given the patient the day before, it was, as a rule, impossible to bring the diuresis to a relatively constant level. Had the patient, however, preparatory to the test, been in bed for several days and on milk diet, the quantity of urine, based on the two-hour tests, underwent only slight variations. Conditions of absorption must be taken into account. Retention in the stomach must be excluded. The digestive system, kidneys and excretory apparatus must perform their functions in a normal manner.

The physiological variations in this way of testing will be seen in Control Tests XIII, XV, XX and XXI. The control is otherwise included in each experiment.

All nitrogen determinations are carried out according to Kjeldahl's method, and the chloride determinations according to Achard and Thomas' method (which, however, is not quite exact). The two-hour and the twenty-four-hour experiments give identical results:

In each and every experiment the diuresis was diminished, and in most cases to a considerable extent.

In the two-hour experiments the diuresis under the influence of hypophysis extract is in six cases reduced to half or less, as compared with the preceding two-hour period.

The effect of the pituitary extracts has been apparent in all cases during the first two-hour period, and in seven experiments has been most marked in the first period, while in three experiments it was most decided two to four hours after the injections.

The effect lasted only for two hours in four experiments, in seven it lasted four hours, and in one experiment (VII) the effect apparently lasted ten hours or more.

The material collected is too small to allow a comparison between the three pituitary preparations employed; they seem, however, to be somewhat similar in their action. The concentration of the urine is increased both as to nitrogen and sodium chloride. As to this point my results are in contrast to those of von den Velden, who could not demonstrate any in-

creased concentration. The results, at which I have arrived, are otherwise, with exception of Falta's, in full conformity with the few previous observations made on man.

The effect has not been influenced by sex, age or disease. It must, therefore, be supposed that the decreased diuresis and the concentration of the urine are effects invariably produced on man. These effects, however, do not appear to have any relation to the clinical blood pressure.

As will be seen from the tables (experiments XII and XVII) pituitrin and adrenalin are injected simultaneously. This is done for the following reasons:

Stenstroem has proved that the hyperglycemia, which invariably results from the injection of adrenalin in rabbits (and most likely also in man) fails to appear on injecting pituitrin. This fact is in most cases confirmed by Boe. As to the metabolism of carbohydrates, there should exist a certain contrary effect between pituitrin and adrenalin.

My two experiments were intended to serve as preliminary endeavors to find out if this apparent antagonism could be demonstrated also in relation to the urinary functions.

The inhibitory action of the pituitrin on the diuresis remained unchanged, so any antagonism could not be demonstrated.

In experiments XVI and XIX an extract of the anterior lobe of the pituitary body was injected. This extract, which is not handled commercially, was courteously placed at my disposal by Messrs. Parke, Davis & Co. No checking influence on the urine quantitatively was observed. In experiment XIX the quantity even seemed increased. This is also in conformity with previous results, viz., that administration of fresh anterior lobe had no influence whatever on the diuresis in Case 1, the diabetes insipidus patient.

The blood pressure throughout all the injections has been measured by Riva Rocci's apparatus. The influence on the blood pressure has not been universal. Out of 14 patients injected with extract from the posterior lobe of the hypophysis, 9 responded with a rapidly lowered pressure (from 1 to 20 mm.) lasting, as a rule, 2-3 hours. In five other patients, after a few minutes, an increased pressure manifested itself, which increase, however, in another few minutes showed a corresponding decrease. In one experiment only did the blood pressure remain unchanged. These divergent results may be due to individual difference in the patients; it is, however, more reasonable to presume that the preparations employed have not been uniform. They contain a number of chemical combinations which partly antagonize each other. Numerous experiments on animals, made to determine the action on the blood pressure, have led to divergent results.

In my two cases in which extract from the anterior lobe was injected, and in one case of

diabetes insipidus (Case 3) no influence upon the blood pressure has been demonstrated.

THE INFLUENCE ON THE NITROGEN ELIMINATION.

In the total number of patients the supply has been constant during the period of experiment. The nitrogen excreted in the urine has been used as a relative standard (the nitrogen excreted by the feces being of minor importance). For practical reasons the patients have not been placed in nitrogen balance. The excretion, as seen from the tables, has been comparatively constant; any more decided wave would have been apparent. In the nine patients—16 experiments—a total of 105 Kjeldahl analyses have been carried out.

In the first three experiments,—the 24-hour arrangement,—a slight reduction of the nitrogen elimination appeared in two, while in the third it remained unchanged. In the remaining cases,—the two-hour experiments,—in each instance there was found a slight decrease in elimination. It appeared as if the nitrogen elimination to a certain degree followed the diuretic wave. The elimination acted in the same manner in the cases treated with pituitrin and adrenalin simultaneously. Extract from the anterior lobe did not exert any inhibitory influence on the nitrogen elimination.

Experiments on animals, carried out in order to bring light on this matter, are few in number. Oswald found no influence on the nitrogen elimination, while Thompson and Johnson, who fed dogs with dried glands, found an increased nitrogen elimination. They arrived at the same results by injecting extracts prepared from the entire hypophysis. Malcolm, Falta and Mochi came to the same conclusion.

Aschner observed a decreased nitrogen elimination in the case of dogs from which the hypophysis had been removed. These experiments have been carried out with the entire gland, and it is quite possible that the almost unanimous experience, viz., that the nitrogen elimination increases, is due to the anterior lobe. (Cf. my experiments XVI and XIX.)

The experience gained in this matter in the case of man is very limited. Von den Velden found no essential change in the nitrogen elimination of the two normal human beings that he examined. Frey and Kumpless came to the same conclusion, or noted a slight increase, in 6 cases.

The posterior lobe of the hypophysis seems to exert a constant physiological influence on the renal functions. The influence may be brought about in various ways.

1. Directly on the kidneys through the circulatory system.
2. Through influences on the nervous system (autonomic or sympathetic).
3. Through influence on other internal secreting organs.

Assuming that all three factors are in action, the influence may be supposed to be exerted directly on the secreting epithelium of the kidneys or on the renal vessels. As to these questions our knowledge is very deficient.

Falta says that all effects of pituitrin,—the slow pulse excepted,—simulate the effects produced by irritation of the sympathetic nervous system, but he maintains, as before stated, that pituitrin increases the diuresis, an opinion which does not coincide with the results of my investigations.

V. Frankl-Hochwart and Fröhlich found in experiments on animals that certain nerves belonging to the autonomic as well as to the sympathetic system, under the influence of pituitrin showed signs of increased irritability. As far as the kidneys are concerned, this matter has not been investigated, and so far remains an open question.

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Therapeutic and Preventive Medicine.

A SIMPLE AFTER-TREATMENT FOR PERINEAL WOUNDS.

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THE proper care of perineal wounds after operation is not such a simple matter as it is

commonly considered, if the best union is to be obtained, since the parts are often and easily contaminated during the healing process. Fortunately, nature does not seem to require the same degree of cleanliness as in other portions of the body, otherwise it is probable that there would be many more failures to obtain a primary union. However, here, as elsewhere, the better the care, the better the results in the long run.

The method generally employed appears to be cleanliness, aided by antiseptic applications in the form of solutions, powders or ointment. Apparently an aseptic vulvar pad is used by all, and some place a strip of gauze between the buttocks on either side of the sutures.

This general form of treatment, with the various minor modifications which the writer has seen employed, possesses a distinct disadvantage in that it maintains neither dryness nor the greatest possible cleanliness.

Whenever moist gauze is applied, as is the practice with some surgeons, the skin and wound are constantly macerated, while the dry gauze soon becomes moist even when antiseptic powders, as generally employed, are dusted over the parts. Under these conditions, tissues about the sutures become sore and irritated and sutures have a greater tendency to cut into a soggy skin. Ointments, while affording some protection, easily collect particles of feces, and once contaminated, are removed with difficulty.

The vulvar pad increases the perspiration in every patient and especially in those who are obese. There is also another disadvantage to the vulvar pad. Besides absorbing the discharges from the vagina and from the wound, it often becomes soiled from the temporary and partial impotence of the sphincter ani; a condition not infrequently seen after perineal operations, and due to irritation of the sphincter, even where the tear is not of the third degree.

At the last meeting of the American College of Surgeons a considerable number of those present at the Boston City Hospital expressed their interest in the treatment of perineal wounds as detailed below. They also had an opportunity to see its practical application as well as the end results.

The method is not new. It has been used on the Gynecological Service by the writer for nearly ten years, and has been generally adopted for some time as the standard treatment. So far as is known, it is not used elsewhere. The aim is to maintain the greatest possible degree of cleanliness and dryness as under such conditions infection and irritation are least likely to occur.

After twenty-four hours, when the bleeding has ceased, the gauze perineal pad is omitted and the genitals and fissure between the buttocks kept liberally covered with a drying and antiseptic powder. For this purpose various mixtures have been used, the best being the compound stearate of zinc with boric acid. Results

have been good with the stearate of zinc alone but rather better with the boric acid added as there is less tendency to decomposition of whatever discharge may come from the wound or elsewhere. The great advantage of the stearate of zinc is that it sheds water and keeps the parts dry. In practice it has been found that mixtures of stearate of zinc and boric acid made by the physician are not so satisfactory as those prepared by the pharmaceutical firms.

The powder is best applied with the patient lying on the side, the upper buttock being raised and the powder thrown into every fold. It is not sufficient to dust lightly or use a powder blower. The parts must be thickly covered, especially between the buttocks, and kept so throughout the healing if the best results are to be obtained. Although the powder gradually becomes moist, it gives excellent protection to the skin, is mildly antiseptic, and sheds water to an amazing degree. With reasonable care it is usually possible to maintain absolute dryness.

If, as occasionally happens, there is considerable tendency to moisture and maceration of the skin, the application of a 10% aqueous solution of ichthol before dusting with the powder will be found effective.

The patient, free from any dressing, lies upon a small pad which collects any discharge from the vagina or elsewhere, and can be changed whenever necessary. The genitals are carefully washed after urination and defecation, and as often as may otherwise seem necessary.

The advantages claimed for this method of treatment are dryness of the parts and so less tendency to irritation and infection. There is also no perineal dressing to increase perspiration, absorb discharges and form a poultice.

Although applicable to all cases, it is especially advantageous where the buttocks are closely opposed, as in the obese, and the secretions of the wound and skin tend to collect between the buttocks.

Many patients can even urinate without contaminating the wound, and the remains of vaginal douches run harmlessly over the surface of the powder when it has been carefully and properly applied. If the parts become soiled, washing, drying and re-powdering leaves everything as before.

In addition to the strictly surgical advantages just mentioned, patients are made more comfortable, both by the lessened irritation of the skin as well as by the absence of a dressing to catch and pull upon the sutures.

The success of this treatment has been amply demonstrated as regards the comfort of the patient and the end results. As a simple method, it may commend itself to surgeons, and possibly to hospitals, as affording an opportunity to save in the cost of dressings.

Clinical Department.

AN UNUSUAL EXOSTOSIS OF THE SCAPULA.

BY LLOYD T. BROWN, M.D., F.A.C.S., BOSTON.

AN unusual case of exostosis of the scapula was found at operation. A search of the literature revealed no similar condition, although a few cases of exostosis in other parts of the scapula were mentioned. This case is therefore reported as of possible interest. The specimen can be seen at the Warren Museum of the Harvard Medical School.

The history was of a girl, sixteen years of age, who came for examination because of a prominent shoulder on the right side. This condition had been present more or less for two or three years, but had apparently been more noticeable and more painful for a few weeks before examination. The pain was present only when the shoulder was used; not present when lying down; was worse when writing, playing the piano, etc. Her general health had always been considered good. Since the increase of pain she had suffered with many headaches and had been much more nervous and irritable. Physical examination showed a well-developed girl, standing with the shoulders drooped, with a marked prominence posteriorly of the right shoulder. There was marked crepitation on movements of the right scapula over the ribs. The scapula at times in sliding over ribs would catch and jump from one rib to another. This was associated with pain. Crepitation and pain were entirely absent when the shoulder was forward. The left scapula was only slightly flexed at the upper angle and showed no symptoms. The diagnosis was either a sharply flexed scapula or an exostosis. There had been no history of injury to the right shoulder. One and one-half years after the patient was first seen, since there had been no improvement with corrective exercises and braces, etc., an operation was performed. A curved incision following the line of a low neck dress was made over the right scapula. The upper angle of the scapula was exposed, the fascia of the trapezius muscle was split and retracted and the upper angle of the scapula after being freed of its muscular attachments was removed with bone cutting forceps on a line parallel to the spine. The opening of the fascia was closed with silk and the skin sutured with silk worm gut. The patient made an uninterrupted recovery, not having had a great deal of pain, the wound healing with primary union. Five months after operation the patient reported herself perfectly well as far as the shoulder was concerned.

The fragment of the upper angle of the scapula showed that it had evidently been attached to the rest of the bone at an angle the reverse of the slight forward flexion which is usually present. (See Fig. 1). In other words, it was bent backward. From the anterior surface of this fragment there was a hook-like process of bone growing out at right angles. (See Figs. 1 and 2).

This process was entirely surrounded by part of the attachment of the subscapularis muscle. It was a little over 3 cm. in length. Its upper border at the base was about 5 mm. below the tip of the superior



FIG. 1.

Shows the exostosis A of the upper angle of the scapula as found at operation and its probable relation to the rest of the bone. Note that the upper angle is bent in a posterior direction so that the normal slightly-flexed position is reversed.

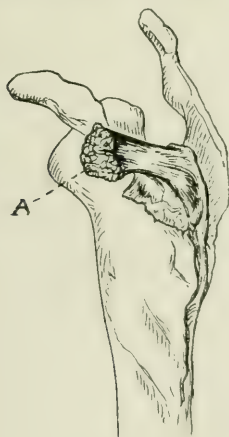


FIG. 2.

Another view of the same.

angle or supraspinata of the scapula and projected anteriorly at an angle of 90° to this. The base of the process conformed to the triangular shape of this portion of the scapula. The end of the process in outline was also triangular, and was rounded with the convexity forward. The convex end was sharply defined from the shaft. It was covered with a white, glistening cartilage-like material and was somewhat irregular on its surface. There was probably a bursa over the end of this bone. The shaft of the process in cross section was roughly triangular and was much smaller at its middle than at either end.

The specimen was shown to the late Dr. Charles Minot, who considered it to be an exostosis, because he knew of no possible congenital origin for such a condition.

This specimen was not examined microscopically, but to all who examined it macroscopically it did not seem to be akin to the bone tumors. It seemed to be an exostosis, although there was no history of injury which might have been an etiological factor. There is record of one other similar case operated upon by Dr. Goldthwait at the Massachusetts General Hospital.

The history of this case was that of a girl, age twenty, who was admitted to the Medical Wards in 1903 for abdominal pain and headaches. In 1905 she was admitted surgically for duodenal ulcer and hemorrhoids, from which service she was transferred to the medical side for gastric neurosis. She complained of pain in the epigastrium and in the back between the shoulders. In January, 1906, she was admitted again because of dull, constant pain in the back referred to the left scapula region. This had been increasing in severity and was interfering with sleep and was preventing work.

Physical examination at this time showed that the motions of the arm and shoulder were free and painless. There was no swelling or inflammation. Slight crepitus was felt when the examining hand was placed on the scapula while the latter was in motion. An operation was performed and the upper angle of the scapula was dissected free and was removed. A sharp hook-like exostosis was found at the upper angle of the scapula which projected forward and rubbed against the chest wall.

Six weeks later the patient returned to the hospital with no pain in the operated shoulder but was having pain on the other side. This side was operated upon and the superior angle of the scapula removed. There was no exostosis present.

In the past eleven years at the Massachusetts General Hospital there have been four cases of exostosis of the scapula but these have all been below the spine, on the posterior or anterior surface, or on the vertebral border.

McWilliams in the *Journal of the American Medical Association*, October, 1914, reports a case of subscapular exostosis. The exostosis was in the lower part of the body and there was definite history of injury.

The question of enchondroma of the scapula has not been discussed in this paper.

These two cases of exostosis of the anterior surface of the superior angle of the scapula are reported because no similar ones were found in the literature.

They are interesting not only because of the unusual place at which the exostosis occurred, but because they were both associated with symptoms of a nervous character which were equally, if not more, distressing than those due to the bone condition found at operation. With the removal of the bony obstruction which had caused a change in the normal position of the shoulder it was possible for the whole body to take on a more normal function with a consequent im-

provement in the general condition. I wish to thank Dr. Goldthwait for permission to report this case.

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Medical Progress.

TENTH REPORT OF PROGRESS IN ORTHOPÆDIC SURGERY.*

BY ROBERT B. OSGOOD, M.D., ROBERT SOUTER, M.D.,
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(Continued from page 621.)

SCOLIOSIS.

Wolff⁵¹ seems to be quite enthusiastic about Abbott's method. He has given up the exercise treatment in severe scoliosis, as he thinks it has only a temporary influence upon such cases. Wolff has used Abbott's method in a number of cases and describes in detail the preparation of the patient, which he considers important. The spine is mobilized for two weeks by baking; the skin stimulated by rubbing with alcohol. The patient is accustomed every day to the position to be assumed in the Abbott cast. One or two days before the cast is put on, the patient remains in bed and is prepared as if he were to undergo an operation. The bowels are kept empty and no food is given immediately before applying the cast. Wolff thinks that some of the accidents which have occurred may be explained by the filling of the stomach too full before the cast is applied. Besides the usual apparatus, Wolff uses wide strips of adhesive plaster which are finally fastened to the plaster cast through the windows. The flexion of the spine ought not to be exaggerated too much. Wolff knows of no method which obtains such a correction and mobilization in so short a time. He has seen cases where the effect was more conspicuous after six weeks of wearing Abbott's jacket than by exercises done for several years. The height was increased in nearly all his cases, sometimes as much as 5 cm. Wolff has examined his cases 6 to 12 months after the end of the treatment, and he has not seen any severe recurrence, though some of them have lost a part

of the correction. For the after-treatment Wolff uses a regular Hessing corset and for the night a plaster bed in an over-corrected position.

Lovett⁵² still persists in the original method which he has used so long because he believes that in this position the thorax has a greater fixation upon the vertebral column than in the Abbott position, and also that the lateral and rotation pressure upon the thorax is, in his position, more likely to be effective for the spine than for the thorax alone. Over-correction is not generally obtained by his method, but there is a distinct improvement in all cases. All the cases that he reports are now out of corrective jackets and in retentive braces with exercises.

Stock⁵³ still holds to the belief that faulty positions long maintained are often the causal factors of scoliosis among school children. He advises shortening the duration of lectures and the establishment of intermissions for exercises in the open air in addition to one hour of definite gymnastic work. The lighting of the desks, he thinks, often leads the child to sit in a strained, unnatural position. He believes that the teacher should pay special attention to the poise of the children and have their posture constantly in mind. Most of these scolioses show improvement without other treatment than the correction of the position, some of them entirely disappear, and only 10% show a progressive character.

Strunsky,⁵⁴ in an article on "Neglected Lateral Curvature," maintains that these deformities are serious and widespread. They cause no premonitory symptoms, and in this respect are unlike tuberculosis. The deviation is frequently discovered first by the teacher, the dressmaker, or the mother. Strunsky thinks that competent orthopedic examination of school children would detect incipient cases or even those with tendencies, and urges more general orthopedic observation in schools.

(Ed. Note.—Goldthwait and the Boston School of Physical Education have been carrying out such supervision and training in posture in one large private school in this city, and at the request of the respective school committees, have assumed the direction of these important preventive and hygienic matters in all the public schools in one considerable city and two large towns. The plan is roughly: (1) Orthopedic medical direction; (2) Supervision by a person trained in postural principles and corrective work, e.g., the head of a normal school of gymnastics. (3) Detailed work with the teachers and pupils by last year students specially taught for this work, who make weekly or bi-weekly visits to the different schools. It is perhaps too early to determine the complete result of this progressive experiment, but thus far (2 years) it is most hopefully successful from an orthopedic point of view and there has been widespread and unexpectedly favorable comment from the teacher and parents, which encourages the continuance and further extension of the plan.)

* This report is based on a review of 440 articles selected from about 900 titles having to do with orthopedic surgery, appearing between Nov. 1, 1914 and Jan. 1, 1916. References are given to only such articles as have been selected for note and comment.

DISLOCATIONS AND FRACTURES.

Subglenoid Dislocation of Humerus.

Sebastian⁵⁵ reports three cases of subglenoid dislocation of the humerus which were unusual in that they were all produced by falls upon the tip of the shoulder, instead of by the more classical forcible abduction of the arm. Their reduction presented no difficulties under ether narcosis.

Fractures of Carpal Scaphoid.

Biedermann⁵⁶ has studied eleven cases of fracture of the carpal scaphoid appearing at Lexer's out-patient clinic in Jena during 1913. When the diagnosis was made early and conservative treatment administered, the results were good, four obtaining perfect function, and three showing only slight limitation of dorsal flexion. In the three cases which came to the clinic several months after the injury, which had not been recognized, more or less limitation of motion was present. Two of these were much improved by operation. In one of these cases the badly altered bone was totally resected and the hole filled with fat, and in the other the softened portion was scraped away and the cavity filled with iodoform wax. In the third old case conservative treatment was followed and "improvement" is reported.

Supracondylar Fracture of the Humerus.

Lusk⁵⁷ believes that a perfect result in these supracondylar fractures of the humerus is prevented by the projection forward of the upper fragment, and the subsequent interference with flexion, which is caused by the callus thrown out at this point. Reduction is not always easy. The posterior periosteum is often not torn across and if this is recognized it may be used as a band in guiding the fragments into apposition. The first movement in reduction should be hyperextension downward; the traction on the forearm allows the lower fragment to be pushed forward and the posterior alignment corrected. The second procedure is pressing forward on the olecranon and backward on the upper fragment of the humerus. The third and last movement is quick flexion of the elbow while the above pressure is being maintained. The arm is immobilized in acute flexion, a pad of gauze pressing back the lower end of the upper fragment.

(Ed. Note.—Lusk's observations on this particular fracture are in accordance with those of Robert Jones, whose axiom is "that all fractures of the elbow, with the single exception of fracture of the olecranon process, should be put up in acute flexion." While there may be other equally good methods of retaining certain of the elbow fractures, the rule is extremely helpful and the value of the position needs to be emphasized, not only as a method of maintaining correct alignment, but also as a means of prevention of future stiffness and of favoring future function. Extension of the elbow is a vastly easier motion to regain than flexion, being in the direction of gravity, and flexion a little more

acute than a right angle is in most cases a better position of permanent stiffness than extension or flexion at a little more obtuse angle than a right angle.)

Fractured Ribs.

Gross⁵⁸ uses the ordinary adhesive plaster in overlapping strips at the site of fracture, but in addition carries a strap over the opposite shoulder. This extra strap enables the patient to walk with much less discomfort.

Cotton⁵⁹ has always been impressed with the idea that non-impacted hip fractures do badly while the impacted unite well. "Then why not impact loose fractures artificially?" Hip fractures are either extra- or intracapsular. If intracapsular, they are either impacted or they are not, and the extracapsular fractures show no tendency to failure of union. The intracapsular fractures, unless they are impacted, often result in non-union. Cotton has not found the expectant treatment unsatisfactory, and after a study of a series of cases treated systematically by direct traction, he has realized that the results were poor. Whitman's method of abduction and readjustment of the fragments often fails through lack of the expert care that is necessary. Cotton's method is a modification of Whitman's, and though perhaps not as scientific, at least seems to be practical. Under moderate anesthesia he pulls the loose fracture into place, then padding the trochanter heavily with felt, he strikes upon it with a heavy wooden mallet with carefully directed blows. As this is done one feels the impaction at the neck and the head, and the free outward rolling motion disappears. The amount of force needed is not great, and the heavy mallet is used in order to get a sufficient impact from a slow and well-controlled swing. The leg is put up in moderate abduction. In no case has any harm resulted. In a number of cases Cotton has in this way obtained impaction of extracapsular fractures, though as yet his results have not been sufficiently proved by the test of time.

Fractures of the Transverse Processes of the Spine.

Stemmler⁶⁰ reports two cases of fracture of the transverse processes of the lumbar spine. The characteristic symptom is the limitation of motion and pain in bending the body laterally towards the well side. There is also pain in forward bending and in straightening and there is local tenderness, but these symptoms may also be present in simple haematoma of the muscles and other conditions. The Roentgen rays offer the only certain method of diagnosis.

Local Congestion in Fractures.

Sprengel⁶¹ in three cases of delayed union in fractures of the lower leg has employed local passive congestion in the following manner. Fairly snug plaster casts were applied and a window cut in the cast over the point of fracture. Several times during the day the patient hung the leg down until a considerable conges-

tion and oedema occurred. The results were most favorable and encouraging.

(Ed. Note.—It seems not impossible if these results should be confirmed that union might be accelerated in fresh fractures by carrying out these methods. The necessity for a careful supervision is at once apparent.)

BONE AND JOINT SURGERY.

Miyauchi⁶² has come to the conclusion that autoplasmic transplanted bone marrow is capable of forming new bone. Its specific myeloid cellular elements remain partly living and represent the cellular trunk from which the regeneration of the bone marrow at least partly proceeds. On the other hand, it has been proven that a considerable part of the young marrow is formed by haematopoietic renaissance. The author could not decide whether these new formations of blood cells take place from the endothelium of the vessels or from the cells of the adventitia.

Davis and Hunnicutt⁶³ as a result of their study, concluded that the free periosteal transplant did not produce bone in most cases, nor did pedunculated flaps of the periosteum. However, when there were attached to these flaps bone chips a new bone was reproduced. A removal of the periosteum seems to have little, if any, effect on the nutrition of the bone. After a subperiosteal resection of a portion of a bone the growth of the bone is not impaired. The new growth was from the bone stump, the periosteum acting simply as a limiting membrane.

"Flexed Scapulae."

Marshall⁶⁴ has reported the late results in 11 cases of forward flexion of the upper angle of the scapula upon whom Goldthwait's operation of removal of the tip of this angle had been performed in the orthopaedic clinic of the Massachusetts General Hospital. In eight cases carefully followed for a long period, the results were most satisfactory as to relief of pain and ability to use the arms without symptoms. In one of the cases, a young neurotic girl upon whom Marshall thinks the operation should not have been performed, there was no appreciable change for better or worse. In the two remaining cases there had been improvement when they were last seen a few weeks or months after the operation, but he was unable to follow them. He concludes that long continued painful symptoms of localized tenderness and crepitation are sufficient indications for operation, and that there are some extremely acute cases of short duration which should also be operated upon. Marshall does not advise the operation in younger patients with mild symptoms. The diagnosis of the condition is made from the curved deformity of the scapula and by the definite tenderness at the upper angle, which is exaggerated by the shrugging of the shoulders. All of the cases show varying degrees of "round shoulders," and treatment of the "posture" should supplement the operation.

Treatment of Cavities After Bone Operations.

Bayer⁶⁵ thinks that the simplest way of filling bone cavities after operations is to trim the edges of the bone forming the cavity, so that a small and uniform trough will result, and then to fold in the periosteum and skin. The soft tissues are pushed in by a roll of gauze to exert pressure on the skin, and this also aids in hemostasis. The periosteum rapidly forms new bone to fill in the cavity.

Misapplied Bone Surgery.

Wilson,⁶⁶ although speaking especially of conditions in Philadelphia, seems to think that the orthopaedic surgeon is too often inclined to operate upon bones. Owing to the development of operative technique and new special operations in bone surgery, there has been in the past few years a great stimulus in this direction. Doubt in diagnosis does not usually justify exploratory operation, because with the exactness of our x-ray and other methods in determining the character of the disease, it is not often that the orthopaedic surgeon need be in doubt as to the diagnosis. The newer operative methods have been enthusiastically followed by some with the idea that they would shorten the course of the chronic disease. Wilson does not wholly accept this view. The mechanical appeal in the application of bone grafts to surgeons who have long used the mechanical brace for supportive treatment is strong, and is in danger of influencing the judgment of the surgeon. This judgment as to the wisest treatment should never lose sight of the nature of the pathological process. Lorenz formerly advocated ankylosis as the best method of curing tuberculosis. There are still those, however, who feel that it is not impossible in tuberculous disease of the joints to obtain a result in which there is fair function with a moderate degree of motion and no pain. There are surely early cases of tuberculosis of the spine in which the protective treatment carefully followed for several years results in an ankylosis which effects only two or three vertebrae. In these cases the bone graft successfully applied would cause an ankylosis of four or five vertebrae. The time saved by the operation would not be a large factor. Wilson believes that "bone transplants or other operations for securing ankylosis are not applicable to early stages of bone tuberculosis when the functional recovery may be obtained with the control of the pathological process."

Injury to the Crucial Ligaments of the Knee.

Morian⁶⁷ in one year has seen five cases of injury to the crucial ligaments. There are said to be only 31 reported cases. In all Morian's cases a piece of bone had been torn off by the anterior ligament, in two cases from the femur, in three from the tibia. The injury was caused by the weight of the body or some other extraneous force being exerted on a partly flexed knee joint in the direction from without inward, a simultaneous inward twist occurring in four cases and an outward twist in the fifth. In only a few reported cases has the force been exerted

from within outward. The symptom of increased antero posterior mobility was wanting in Morian's cases, for in none was the anterior ligament entirely torn away. The x-ray revealed the condition. Two of the cases presented symptoms resembling "joint mice" with a more or less chronic hydrops.

(Ed. Note.—Our experience leads us to believe that injuries to the crucial ligaments are more common than have been supposed. Within the past year five cases have been seen in the orthopaedic clinic of the Massachusetts General Hospital, not all diagnosed before, but all confirmed at operation. Brackett has had two more private cases confirmed by operation. The exposure of the knee joint by a long vertical incision splitting the patella makes possible the inspection of these ligaments. The anterior, as Morian says, is frequently only partly torn and often may be repaired or the tab with its small bit of torn-off bone removed, and the "catching" thereby relieved. The posterior ligament, fortunately apparently rarely torn, is most difficult to reach.)

Transplantation of the Whole Knee Joint.

Deutschländer⁶⁸ reports a case of homoplastic transplantation of the whole knee joint, including capsule, ligamentous apparatus, and patella. The result was not encouraging and consisted in a slightly mobile pseudoarthrosis.

Fascia Lata used to Reinforce Suture of Patella.

By the use of a free flap of fascia on the sutured patella, Seubert⁶⁹ has obtained excellent results. He began massage and exercise of the thigh on the third day, and on the tenth day careful motions of the knee joint. Two weeks after the operation the patient was allowed to be up. After five weeks he was able to go up and down stairs without any trouble, and the movements of the knee joint were nearly normal.

Payr⁷⁰ reports with pride that two cavalry officers have gone through the campaign to date without the least disturbances from the knee which he had previously operated on. He had mobilized the totally stiff joints and introduced a pad of fascia and fat. This has restored practically normal function to the joint even through the stress of the active campaign which he records as the severest test of arthroplasties that can be imagined.

POSTURE, BODY FORM, ETC.

Care of the Abdomen in Infancy and Childhood.

Mosher⁷¹ discusses the care of the abdomen and the development of the abdominal muscles during infancy and childhood. During the first six months there being no question of posture, there should be provided a firm, flat place to lie upon rather than a bumping carriage. During the next six months the abdominal muscles begin to gain in strength as the child learns to sit and then to stand. In the following year of play Mosher thinks that two things are of much importance: (1) the sleeping without a pillow, and (2) the assumption during a part of the rest

time of the ventral position. Too much sitting on the floor should be avoided.

The Mechanically Unfit.

Swaim⁷² has studied the types of body form in 3000 sanitarium cases, all of whom were more or less chronic invalids, and found that of this number only very few could be considered posturally normal. As types of body form Swaim takes Treves' classification of the so-called herbivorous class, the intermediate, and the carnivorous class. The carnivorous corresponds to the congenital visceroptotic type of Goldthwait, and he finds that by far the greater proportion of sanitarium patients are of this type.

(Ed. Note.—This study seems to us of special significance. Visceroptosis and faulty posture often exist in individuals who are active in body and mind, but if we should find, as Swaim's investigations suggest, that our general sanitarium patients nearly all show these conditions, and that our groups of tuberculous cases present similar pictures, and that disturbed kidney function is often associated with faulty posture, we would seem to be gradually accumulating evidence that orthopaedic attention to these anatomic facts is of more than cosmetic value and is of vital importance to the health of the human race.)

Lordotic Albuminuria.

Fischl and Popper⁷³ have made a careful and exhaustive study of a number of patients showing this condition and have carried out special tests on two cases; they have been unable, however, to come to any definite conclusion as to its exact cause. The condition appeared in the strong and well-developed as well as in the weak and anemic types. The two cases especially observed were one of each type. It is comparatively rare, many lordotic individuals showing no trace of albuminuria. The authors are inclined to believe that the explanation is to be found in a mechanical cause, resulting in congestion of the renal vessels, together with a local and general predisposition. A support of the Hessing-Neider type has been successful in treating the conditions by improving the posture.

Significance of Pain in Lower Back and Legs from an Orthopaedic Standpoint.

Silver⁷⁴ while admitting that the orthopaedic surgeon often pays too little attention to abdominal conditions, which owing to the nerve reflexes may give rise to pain in the lower back and legs, feels that the general practitioner still more often neglects a consideration of the osseous, ligamentous, and muscular abnormalities which may give rise to these same symptoms. Silver recognizes the importance and the frequent occurrence of tuberculosis and other infectious processes in the spine, but believes special attention should be given to the question of statics and posture in relation to pain. Defective attitudes are assumed not only in standing, but in sitting and lying, and in accordance with the requirements of various occupations. The sacrum, he maintains, is not really a keystone,

but must be considered as suspended from the iliac bones by strong posterior ligaments. In the upright position it is likely to be a much more unstable joint than the hip or the knee, owing to the vertical plane of its articular surfaces. The author admits that the diagnosis of sacro-iliac relaxation is "overworked," but maintains that these relaxations do often occur. We know that gradual compensatory sacro-lumbar and sacro-iliac relaxations take place in ankylosis of the hip, and why should they not in cases of severe repeated conditions of strain or traumatism? If perfect fixation is to be obtained, Silver uses a cast from ankle to axilla. Muscle training, rather than muscle building, is the method of cure.

(To be continued.)

Harvard Medical School.

MEDICAL MEETING.

IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, ON TUESDAY EVENING, APRIL 18TH, AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

Paper of Professor W. T. Councilman: Ochronosis and Alkaptonuria.

The specimens which I wish to demonstrate this evening are from a man of 68 years, who was a patient of Dr. Ogden of Milwaukee. He was first seen by Dr. Ogden thirty-five years ago on the occasion of an examination for life insurance. The urine at that time was black. In other respects, however, the man appeared to be in perfect health.

During the last few years of the patient's life (he died in 1914) he was to a large extent incapacitated, due to the arthritic condition of his joints. He had been a great walker throughout his earlier years and this confinement was necessarily an extreme hardship.

The specimens which you see show the intense black color of the joint cartilages. The erosions and irregularities of the joint surfaces amply explain the clinical features of arthritis.

(Dr. Councilman read extracts from the report of this case, which will be published under the names of Ogden and Boretti.)

The recognition of ochronosis dates back to 1866. It was first described by Virchow in the *Archives* which bear his name, volume 37. Homogentisic acid which gives to alkaptonuric urine its peculiar properties was discovered by Marshall; but it remained for Wolkow and Baumann to isolate it from a case of alkaptonuria. This was in 1891. It was not until 1902 that the relationship was pointed out by Albrecht between alkaptonuria and ochronosis. A pigmentation of the cartilage was found in all of the older cases of the latter disease. There are now some 10 cases of ochronosis reported which are attributed to the prolonged external use of weak carbolic acid. The youngest individual reported as

having ochronosis was 31 years of age. Alkaptonuria, on the other hand, occurs frequently in early life. This condition is probably congenital in all cases. It is hereditary and there is evidence to show that it occurs rather more frequently as a result of the marriage of cousins.

The pigment was supposed by Virchow to be an iron pigment derived from the blood. A more careful investigation, however, has shown that it is very closely related to melanin. It appears likely that it is formed by the action of a ferment tyrosinase or tyrosine. Such a ferment has been isolated from cartilage.

The deposition of pigment has varied in different cases. It may be found in any of the cartilages of the body, but is rather more frequently encountered in that of the femur. It has been discovered in the lining of the aorta and in the sclerae.

(Lantern slides of the case were shown).

Paper of Dr. S. C. Harvey: The Use of Fibrin Paper and Forms in Surgery.

A great amount of work has been done in the attempt to secure means of controlling hemorrhage. Two types of bleeding are encountered surgically. The first is seen in patients who are hemophiliacs or who are suffering from icterus. In the second, the hemorrhage results from parenchymatous injuries, from operative trauma to delicate structures such as the pia-mater, and so on.

The methods which have been used to combat these forms of hemorrhage are likewise of two types. Kephalin and the Kocher-Fonio coagulen are examples of the one type which depends upon chemical means to decrease the coagulation time of the blood. One objection holds true for all these substances. To apply solutions of this nature, some form of tampon is necessary, and in the removal of the latter, the clots are dragged from the hemorrhagic areas leading to secondary bleeding.

Experiences of this sort led to the use of hemostatic agents of a second type. These include various tissues such as muscle, fascia and fat. Bits of muscle have been used successfully for this purpose by Sir Victor Horsley and Dr. Cushing for many years.

Last year Dr. Grey undertook to find an absorbable substance which might be used in place of muscle. He has shown that fibrin from human or animal blood may be satisfactorily employed for this purpose. It can be sterilized and it is readily absorbed by the tissues.

Fibrin in its natural state, however, has certain disadvantages. These I have attempted to overcome. By using a process somewhat similar to that employed in the manufacture of paper, I have prepared a fibrin paper. This enables the operator to secure hemostasis with a minimum amount of the material. After grinding up the fibrin it is suspended in water and then thrown down on a fine-meshed strainer. Great pressure is now exerted on it, converting the film into a thin flexible sheet. It is then autoclaved for 15 to 30 minutes. When moist this substance has considerable strength. It is partly translucent and slightly elastic. On drying it becomes hard and brittle.

The thinner sheets control bleeding quite efficiently. A further refinement consists of cutting sections from a block of fibrin with the microtome. Material of this nature has been used successfully for several months by Dr. Cushing in his cerebral

surgery. Thin sheets are absorbed in animal in about two weeks. Sections cut at 40 micra are absorbed in seven or eight days. The same process that is noted in the repair of wounds is found in the absorption of the films of fibrin, except that toward the end of the reaction in the latter there is some giant-cell formation, showing that the fibrin acts slightly like a foreign body.

The second use to which fibrin has been put has been in the end to end anastomosis of the intestines according to the method of Halsted—the so-called bulkhead suture method. Dr. Halsted some time ago devised this technique in order to make such an anastomosis a strictly aseptic procedure. He used cones of candy and of paper.

Dr. Fleming suggested the need of some absorbable substance which would better answer the requirements of this bulkhead suture operation. We devised cones of fibrin paper which have proven to be very satisfactory. The fibrin forms are sufficiently stiff to enable the operator to carry out all of the necessary steps of the operation. They soften, however, within an hour or so and are easily handled by the intestine. Within ten to twenty hours complete digestion occurs (in the upper intestine). The operation has now been successfully performed on a number of dogs.

Paper of Dr. Henry A. Christian: Renal Function in Pernicious Anemia.

Pernicious anemia presents the interesting condition of a patient whose blood is reduced far below the normal. One would naturally assume that such a change would have an effect on many of the viscera.

Dr. Du Bois, who recently addressed this society, found from his respiratory studies that the metabolism in this type of disease is considerably above normal. In this clinic Drs. Peabody and Wentworth have discovered practically no change in the vital capacity of the lungs.

We know that the function of the stomach is very definitely interfered with, an anacidity usually being found in such patients. The total acidity is likewise much below the normal. When the blood shows a return to near the normal number of red cells the gastric function still remains impaired. This has suggested that there is probably some connection between the anacidity and the primary cause of the disease.

We have been studying the function of the kidneys in this class of cases. The phenolphthalein test has shown nothing remarkable. Even in the severer cases there is practically a normal phthalein output.

Our interest has chiefly been centred on the dietary functional tests. If we test the urine in normal subjects at two hour intervals when they receive about three meals a day, we observe distinct variations in the renal function. With an increased amount of protein consumption there is usually also an increased sodium chloride and purin intake. The latter act as diuretic agents. This accounts in part for the fluctuations in amount of the urine throughout the day. Where the urinary output is large in amount, furthermore, the specific gravity is usually lowered. From the variations brought about in this way we obtain figures, which when plotted on paper, give us an up and down curve, the so-called picket-fence curve. There are normal curves of this type for the specific gravity, the sodium chloride excre-

tion, the nitrogen-output, the quantity of the urine, etc.

When the kidneys are diseased they lose their ability to vary the specific gravity and the output of the various constituents of the urine. As a result the curves show smaller variations and tend more to approach straight lines.

A number of cases of pernicious anemia studied in this manner have afforded us some interesting findings.

(Lantern slide demonstration of charts).

The specific gravity curves are almost flat lines. The nitrogen-output curves also show some flattening. While the phthalein excretion is normal, and the urines show only an occasional cast and a trace of albumen, the curves reveal a functional disturbance quite similar to what we get in chronic nephritis. Such curves are fairly constant from day to day though the actual amounts of urine secreted may vary.

Following transfusion the curves again become slightly more irregular in outline. Just what the nature is of this functional disturbance is at present unknown. It is not of a circulatory nature, a chronic passive congestion, for the hearts are not materially affected. Pathologically, the kidneys do not ordinarily show a nephritis. As a rule, furthermore, such patients do not have arteriosclerosis to any marked extent. Certainly there is no parallelism between the arteriosclerotic changes and the results of the functional tests.

It might appear at first sight as though there were some relation between the therapy used and the curves, since it has been shown that arsenic will cause an acute nephritis in animals. Only certain of our patients, however, have received arsenic or salvarsan.

The most likely conclusion is that this functional disturbance of the kidney is in some way related to the anemia. We have used different forms of treatment in our patients,—splenectomy, arsenic, salvarsan, transfusion, etc., so that we are having an opportunity to study the effects of the different therapeutic measures on the curves of renal function.

ERNEST G. GREY, M.D.

PANG SUEY BILL KILLED.—By a roll call vote of 129 to 94, the House rejected the so-called Pang Suey bill to permit the gratuitous prescription of natural herbs. This action was taken after a debate lasting more than one hour. In favor of the measure it was stated that only six persons in the state would practise under the bill, and that two thousand persons were waiting to take the "natural herb" treatment. One speaker, in urging the passage of the bill, said that the Chinese doctor in question holds the highest medical degree given in China, and that we cannot scoff at the results of a civilization far more antique than ours. This view is certainly broad-minded; it is well enough to acknowledge our debt to antiquity, but credulity such as this, especially in view of the recent reports on medical education in China, shows a lack of discrimination in the true value of things.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE PROBLEM OF THE FEEBLE-MINDED.

EVERYONE has known, at sometime or other, a feeble-minded person. In large cities, unfortunately of this type usually settle down to the bottom of the social mixture. In the country, they lead rather better lives. Their fellow-townsmen become accustomed to their eccentricities, and often employ them for simple kinds of work. In the city, where competition is keener and each man's responsibility for his neighbor is less, they do not fare so well. As tools of unscrupulous, cleverer people, they frequently become offenders against the law—a fate which is really a blessing in disguise if they are recognized as feeble-minded, and are sent to one of the schools for mental defectives.

Unfortunately, the schools at Waverley and Wrentham now provided by the state for this purpose are crowded, with waiting lists of 400

applications at Waverley and 456 at Wrentham. Approximately 2000 feeble-minded can always be found in other public institutions. According to the League for Preventive Work, which represents some 20 charitable associations of Boston, there are about 15,000 mental defectives in Massachusetts.

The Massachusetts Legislature of 1915 made an appropriation of \$50,000 for the purchase of land for the establishment of a third school. A tract of 880 acres of farm land has been purchased in Belchertown, and now bills are before the Legislature calling for an appropriation of \$150,000 annually over a period of five years, for the construction of buildings suitable to house one thousand inmates.

It is difficult to see what arguments can be raised against such an expenditure. Not only will crime and immorality of the most bestial type be decreased by the segregation of these one thousand feeble-minded, but the poor unfortunates themselves will be enabled to live comfortably, with simple work, plenty of food and decent surroundings. The expenditure will be a good investment, for the cost per capita is less in an institution such as is contemplated than in the almshouses, jails and hospitals in which many of the mentally defective are now supported. The greatest argument of all in favor of the bill is that segregation of these people will prevent them from perpetuating their kind. Breeding, as they do, nearly twice as many children as do normal individuals, their menace increases steadily year by year. An enlightened state will safeguard its future by such measures as the building of a new school at Belchertown.

NEW AND NON-OFFICIAL REMEDIES.

THE recently published 1916 edition of "New and Non-Official Remedies," issued by the Council on Pharmacy and Chemistry of the American Medical Association, is the latest output of a work, whose value, scope and character are, perhaps, as yet not fully appreciated by the profession. The volume is unpretentious, the contents conservative and unsensational, so that a hasty and superficial examination does not reveal its real merit.

"New and Non-Official Remedies" is the only source of authoritative information for practitioners about the newer remedies of whose value.

often considerable, judgment should not be made solely from commercial statements. The Council on Pharmacy and Chemistry is composed of chemists, pharmacists, pharmacologists and clinicians of the highest standing in this country and is affiliated with corresponding members in Germany and England. Indeed it is recognized internationally as an authority on the newer remedies.

Moreover, "New and Non-Official Remedies" supplies practitioners with a large amount of useful information about the comparative action, toxicity, dosage and reliable sources of supply of many drugs and preparations.

This volume, then, is both authoritative and educational, and is a worthy contribution by the American Medical Association to the cause of therapeutic reform.

"That it shall be unlawful for any officer or employee of the Public Health Service of the government to be or become a member or officer of, or in any way connected with any medical or private health association or organization of any kind."

It is believed that this resolution, the effect of which would be not only to cause the resignation of Dr. Blue, but to prevent all members of the Public Health Service from belonging to any civilian medical society, had its genesis in the recent action of Dr. Blue in advocacy of two bills now before the committee on public health for the addition to the Public Health Service of two new bureaus on rural sanitation and on mental hygiene. Senator Works, who is a member of this committee, has objected to these bills on the ground that the Public Health Service has exceeded its constitutional authority in attempting certain enterprises which he believes belong within the provinces of the state governments.

A CHRISTIAN SCIENCE CONSPIRACY.

REPORT from Washington, D. C., states that on April 11th Senator Works of California, who is described in "Who's Who" as a Christian Scientist, initiated a movement to cause the resignation of Surgeon-General Rupert Blue of the United States Public Health Service as President of the American Medical Association, by introducing a joint resolution which he asks should be referred to the committee on public health. This resolution was as follows:

"Whereas, the American Medical Association is a national organization of physicians and surgeons of one school of medicine only and intended to advance the personal and private interests of its members; and

"Whereas, one of the objects of said association actively and aggressively prosecuted is to procure legislation, state and national, in the interest of the school of medicine represented by it and against all others; and

"Whereas, the Public Health Service of the United States is intended to represent all classes of people of all medical or non-medical beliefs in national and interstate affairs: and

"Whereas, the surgeon-general of the Public Health Service has been elected president of the said association and other officers of the service have become members thereof: and

"Whereas, it is believed that the best interests of the Public Health Service and of the people require that its officials and employees be free from influence or control by any school of medicine, or mode of healing;

"Now, therefore, resolved:

PROPOSED REORGANIZATION OF STATE BOARD OF INSANITY.

THE special committee on commissions of the Massachusetts General Court, reported on April 11th, a bill for the reorganization of the State Board of Insanity. This bill abolishes the present board of three paid members and substitutes therefor a bureau of insanity, consisting of a director, who shall receive a salary of not more than \$7,500, and who shall be a physician, and four unpaid members, two of whom shall be physicians. All the members are to be named by the Governor subject to confirmation by the Council, each member to hold office for a term of five years.

Another section of the bill restores to the boards of trustees of the various institutions under the jurisdiction of the bureau of insanity the powers which they enjoyed prior to the reorganization of the State Board of Insanity only two years ago. This section further provides, however, that the Governor may at any time request the proposed bureau to assume management of any of the institutions in case he considers such procedure advisable.

Senator Hayes, chairman of the committee on commissions, with three other members of the committee, is recorded as in dissent to the report favoring this bill and announces that he will offer a substitute bill for an unpaid board of five

members to consist of the three present members, and of two more to be appointed by the Governor.

It is unfortunate that the subject of further reorganization of the State Board of Insanity must be again raised so soon after its recent reorganization on a basis then supposed most desirable and efficient. Further editorial comment on this subject will be made in a subsequent issue of the JOURNAL.

MEDICAL NOTES.

HAVERHILL INSTITUTIONS BENEFIT.—By the will of Mary N. Martin of 60 The Fenway, Hale Hospital and the Old Ladies' Home Association, both of Haverhill, will each receive \$1000. Other bequests are made and the residue is given to the New England Home for Crippled Children.

WILL OF DR. WILLIAM P. BOLLES.—Many public bequests are contained in the will of the late Dr. William P. Bolles of Roxbury, who died in California in March. The New England Genealogical Society is given all the genealogical books and papers; the Boston City Hospital gets all the medical books; Dr. Wilfred T. Grenfell, superintendent of the Labrador Mission, all surgical instruments and apparatus, and the Connecticut College for Women at New London, the general library of Dr. Bolles, and scientific apparatus, such as microscopes, telescopes, photographic cameras and lenses, drawing instruments, etc.

WOMAN'S MEDICAL COLLEGE FELLOWSHIP.—The Woman's Medical College of Pennsylvania has established a fellowship amounting to \$1000, to be awarded annually to any medical woman of special ability who, following the undergraduate course, has completed at least one year of hospital service, including work in maternity wards, and one year of further practice. The amount is to cover twelve months of special work as Fellow in Obstetrics, with the condition that the holder of the fellowship shall thereafter continue the practice of obstetrics.

LONDON DEATH RATES IN 1915.—Statistics recently published show that during the year 1915, the total death rate of London was only 16.1 per thousand inhabitants living. Among the several districts and boroughs the highest yearly death rate was 20.2 in Bermondsey, a populous southern slum, and the lowest was 12.4 at Lewisham, a more open southern suburb.

DISBURSEMENTS OF ROCKEFELLER FOUNDATION.—Report from New York on April 6 states that the disbursements of the Rockefeller Foundation for the year 1915 were announced as follows on

that date: The total of funds distributed by the Rockefeller Foundation during 1915 was \$3,643,000, of which \$582,339 was for war relief. The international health commission and the China medical board received respectively \$441,301 and \$157,623. For scientific study of problems in government the foundation contributed \$50,000.

Included in the war relief distributions were these items: Belgian food supply, \$2839; Belgian relief work in Holland, \$78,410; Belgian University professors, \$20,000; commission for relief in Belgium, \$200,000; Serbian sanitation and relief, \$104,332; Persian relief, \$30,000; Armenian relief, \$40,000; international committee, Y. M. C. A., \$25,000; Rockefeller Institute for Medical Research, \$25,000; advanced for war relief, but not expended, \$25,000.

PROPOSED UNION OF PHILADELPHIA MEDICAL SCHOOLS.—Report from Philadelphia states that on April 7 Dr. William Pepper, dean of the University of Pennsylvania Medical School, announced that a plan had been proposed for the union of that school with the Jefferson Medical School and the Philadelphia Medico-Chirurgical College. Details of this project, or the possibility of its fulfillment are still uncertain.

PSYCHOPATHIC HOSPITAL IN NEW YORK.—It is announced that an anonymous donor has offered to give the sum of \$500,000 towards the establishment of a Psychopathic Institution in New York, provided such an institution be established by the passage of the Wheeler Bill now pending before the General Assembly at Albany. This proposed bill provides for the creation of a commission of seven to supervise the work of examining and diagnosing cases of mental deficiency under observation at a new psychopathic institution.

STATE PUBLIC HEALTH WORK.—The Council on Health and Public Instruction of the American Medical Association has recently published an extensive report of state public health work, based on a survey of state boards of health, compiled by Charles V. Chapin, commissioner of health, of Providence, R. I. The council states its purpose in making this report to be as follows:

"The publication and distribution of this report completes the first effort that has been made to carry on a comprehensive and comparative survey of the public health work of the various states and to undertake some kind of comparative rating of the work being done in the different states. The object of the Council in undertaking such a task is not in any sense due to a desire to be either critical or dictatorial, but rather to present in tabulated form the essential facts regarding state public health work as viewed by a recognized expert on this subject. It is hoped that the discussions of state public

health work and the comparative tables will be of service to state boards of health in presenting to governors, legislators and legislative committees a clear statement of the facts regarding public health work in each state; that the rating sheet may be of value in pointing out the weak points in each state, by the strengthening of which the relative standing of the state may be raised; and that the collection and publication of the facts contained in the report may be of some service in increasing the effectiveness of state public health work."

The volume opens with a survey of public health work. Then follow summaries of the conditions in each state. Under the heading of the states is arranged a discussion of the organization of the department of health, of the powers of the executive heads, local health administration and the state management of communicable diseases, the keeping of vital statistics, child hygiene, public health education, food, engineering, and miscellaneous duties. The book ends with a financial statement, ratings of the states, and various tables of epitomized facts.

DISCOVERY OF A NEW SERUM.—Report from Paris on April 4 states that on April 3 Dr. Pierre Roux, director of the Pasteur Institute, announced before the Academy of Sciences the discovery of a serum for the treatment and prevention of a so-called eruptive typhus. The discovery is said to have been made as a result of the researches of Dr. Nicole, director of the Pasteur Institute at Tunis, where the disease is prevalent.

CHILD BEARING AND THE STATE LABOR LAW.—Some time ago it was suggested that the New York Board of Health adopt suitable regulations prohibiting the industrial employment of women immediately before and after childbirth, the opinion being expressed that this was an important cause of ill health. Since such a regulation is already part of the state factory law, a survey was conducted to determine whether any additional legislation was necessary and to what extent, if any, the present factory regulation is being violated. The study was made in Health District No. 2 and embraced the mothers of babies under one year of age. Altogether 750 such mothers were counted and of these only three went to work in a factory, two, four, and six months respectively after confinement. It must, of course, be borne in mind that this relates almost entirely to Yiddish mothers in one small part of the city; possibly a city-wide census would disclose other conditions. In this connection, it may be pointed out that the high mortality among negro mothers in New York City has been laid to the early return to work on the part of these.

EUROPEAN WAR NOTES.

PLAN HOSPITAL TO RESTORE WAR RUINED FACES.—A committee of prominent Boston surgeons and dentists, of which Dr. Charles M. Proctor is chairman, has issued an appeal for funds to establish a special American hospital in Paris for wounds of the face and jaw. Already the greatest facial surgeons in the world have offered their services, the French war office has agreed to put a suitable building at their disposal, and the American Red Cross will furnish supplies. Because of the character of trench warfare, the number of face wounds in this war has been proportionately greater than in any other war, and the facilities for treating them have been entirely inadequate. So great has been the demand for hospital space that there has been no time and no place for any treatment except to prevent infection, and the delicate rebuilding work has had to be practically neglected.

In asking for funds the committee says that \$20,000 will establish and maintain 100 beds and make a great work possible. The committee desires, however, to equip the hospital with 500 beds. The appeal says: "The work of this special American hospital is to restore as nearly as possible the facial contour, thus enabling these horribly mutilated men, who in their present condition are extremely repulsive, to mingle with their fellow-men and earn a livelihood." The dental profession of America is responsible for the undertaking. Subscriptions amounting to \$1765.00 have already been received. N. Penrose Hallowell, 44 State St., Boston, is the treasurer.

MEDICAL WORK IN BELGIUM.—Dr. William Palmer Lucas, Professor of Pediatrics at the University of California, has been asked by Mr. C. H. Hoover to go to Belgium for relief work in connection with the infants' and children's dietetic problems which have arisen there. Dr. Lucas sailed on the *Philadelphia* on April 22, and expects to be away for at least three months.

WAR RELIEF FUNDS.—On April 30 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$115,333.20
Serbian Fund	90,723.78
Allied Fund	87,386.36
French Wounded Fund	74,413.34
British Imperial Fund	53,963.31
French Orphanage Fund	40,670.07
Armenian Fund	37,727.03
Polish Fund	30,210.71
Surgical Dressings Fund	23,894.17
LaFayette Fund	20,063.53
Italian Fund	17,108.56
P. S. D. Fund	8,295.83

Cardinal Mercier Fund	5,334.00
Facial Hospital Fund	5,278.00
Brittany Hospitals Fund	2,792.50
Belgian Tobacco Fund	1,488.93
Allies' Tobacco Fund	1,283.50
French Musicians' Fund	290.80

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 29, 1916, there were 265 deaths reported, with a rate of 18.17 per 1,000 population, as compared with 254 and a rate of 17.70 for the corresponding week of last year. There were 29 deaths under 1 year, as compared with 48 last year, and 100 deaths over 60 years of age against 76 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 47; scarlet fever, 60; measles, 260; whooping cough, 19; typhoid fever, 5; tuberculosis, 42.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 17; measles, 1.

Total deaths from these diseases were: Diphtheria, 6; scarlet fever, 2; whooping cough, 1; tuberculosis, 24.

Included in the above were the following deaths of non-residents: Tuberculosis, 2.

HUNTINGTON HOSPITAL FOR CANCER RESEARCH.—The third annual report of the Collis P. Huntington Memorial Hospital for Cancer Research and of the Laboratories of the Cancer Commission of Harvard University, records the work of these institutions for the year ended June 30, 1915. The consulting surgeon, Dr. Robert B. Greenough, summarizes the results of the year by stating that radium offers a method of treatment of cancer cases, probably curative in certain superficial lesions and of marked palliative benefit in more advanced and deeper conditions. He further states that the development of x-rays in the treatment of cancer is greatly needed and facilities for the investigation of x-ray therapy are greatly to be desired at the hospital. The number of patients treated at the hospital increased rapidly. There were in all 509 patients treated in the house and out-patient departments, as against 313 the year before, an increase of 62%. There were 5725 in-patient days and 3676 out-patient visits in 1914-1915.

THE BOSTON LYING-IN HOSPITAL.—The recently issued annual report of the Boston Lying-in Hospital records the work of the 83rd year of that institution, and covers the period from Jan. 1, 1915 to Dec. 31, 1915. It states that fourteen per cent., or one-seventh of the babies born in Boston last year were born to patients of this Hospital, and emphasizes the great need of larger quarters to carry on the ever increasing

amount of service that the Hospital is able to do each succeeding year. Only the poorer classes of patients who can be received in wards can now be provided for by the Hospital, but the need of private rooms for the use of patients in better circumstances is great. Mention has at various times been made in this JOURNAL of the efforts of the Trustees to increase the present fund for the building of a new hospital. The report states that about \$195,000 more is needed before operations can begin. In the Hospital 924 patients (mothers) have been cared for and 897 babies born. The out-patient departments have attended 1932 mothers and 1960 babies have been born. The pregnancy clinics have treated 628 patients before admission to the Hospital and 1187 before admission to the out-patient department.

A NEW HARVARD UNIT.—The next Harvard Unit to take service with the British Expeditionary Force in France will be in charge of Dr. Hugh Cabot. There is special need for recent graduates of Harvard who have had some training in surgery; applications may be sent to Dr. Hugh Cabot, 87 Marlborough St., Boston. The term of service is six months, and the Unit expects to sail about the middle of May.

Obituary.

DAVID CHOATE, M.D.

DR. DAVID CHOATE of Salem died at his home April 23, 1916, aged 87 years. He was born in Essex, Nov. 27, 1828, and was a nephew of Rufus Choate and a second cousin of Joseph H. Choate. Graduating from the Harvard Medical School in 1854 in the same class with Samuel A. Green, he settled in Topsfield, where he practised for three years before making his permanent residence in Salem. During the Civil War, he was examining surgeon for volunteers and drafted men, and examiner for pensions from 1863 to 1869. He was physician on the staff of the Salem Hospital from 1873 to 1887, and was at one time city physician and a member of the school board. He joined the Massachusetts Medical Society in 1854 and was a member of the Essex South District Medical Society, his name being placed on the retired list in 1889.

Dr. Choate was for years a deacon in the Tabernacle Congregational Church, was a noted Bible student and a contributor to religious publications. His wife, who was Susan Temple of Ipswich, died ten years ago, and he is survived by one daughter and two brothers.

Miscellany.

NOTICES.

EXAMINATION OF CANDIDATES FOR ASSISTANT SURGEON.—Treasury Department, United States Public Health Service.—Boards will be convened at the Bureau of Public Health Service, 3 "B" Street, S. E., Washington, D. C., and at a number of the Marine Hospitals of the Service, on Wednesday, May 31, 1916, at 10 o'clock a.m., for the purpose of examining candidates for admission to the grade of Assistant Surgeon in the Public Health Service.

The candidate must be between 23 and 32 years of age, a graduate of a reputable medical college, and must furnish testimonials from two responsible persons as to his professional and moral character, together with a recent photograph of himself. Credit will be given in the examination for service in hospitals for the insane, experience in the detection of mental diseases, and in any other particular line of professional work. Candidates must have had one year's hospital experience or two years' professional work.

For invitation to appear before the board of examiners, address "Surgeon-General, Public Health Service, Washington, D. C."

EXAMINATION OF CANDIDATES FOR UNITED STATES NAVY MEDICAL CORPS.—The next examination for admission into the Medical Corps of the Navy will be held on or about June 16, 1916, at Washington, D. C., Boston, Mass., New York, N. Y., Philadelphia, Pa., Norfolk, Va., Charleston, S. C., Great Lakes (Chicago), Ill., Mare Island, Cal., and Puget Sound, Wash.

The applicant must be a citizen of the United States, between 21 and 30 years of age, a graduate of a reputable school of medicine, and must apply for permission to appear before a Board of Medical Examiners. The application must be in the handwriting of the applicant, and must be accompanied by the following certificates:

- Letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character.
- A certificate to the effect that the applicant is a citizen of the United States.
- Certificate of preliminary education: The candidate must submit a certificate of graduation from an accepted high school or an acceptable equivalent.
- Certificates of medical education: This certificate should give the name of the school and the date of graduation.
- If the candidate has had hospital service or special educational or professional advantages, certificates to this effect, signed by the proper authorities, should also be forwarded.

Application should reach the Bureau of Medicine and Surgery not later than June 5, 1916.

Successful candidates are appointed Assistant Surgeons in the Medical Reserve Corps, and if so recommended are subsequently assigned to duty, with full pay and allowances, in attendance upon a course of instruction at the Naval Medical School, Washington, D. C. This course begins annually about October first and lasts about six months. Upon the completion thereof, the student officers are given their final examination, and, if found qualified, are commissioned as Assistant-Surgeons in the regular Medical Corps of the Navy.

Assistant surgeons are examined for promotion at the expiration of three years' service, and, if successful, become passed assistant surgeons. Promotions to the higher grades are made in the order of seniority to fill vacancies as they are created (by resignation, retirement, or death), and for each promotion a physical and professional examination is required by law.

The pay of an assistant surgeon is \$2000.00 per

year on shore duty, and \$2200.00 at sea. At the expiration of the three years mentioned in the preceding paragraph, if successful in passing the examination for the rank of passed assistant surgeon, pay on shore is \$2400.00; at sea, \$2640.00. After a total of five years in the service, pay on shore is \$2640.00; at sea, \$2904.00. Both at sea and on shore, quarters or their equivalent are provided; if these are not available on shore duty, an ample, appropriate allowance is provided for rental, heat and light of same. An allowance of eight cents a mile is also provided when traveling on orders.

Full information with regard to physical and professional examinations, with instructions how to submit formal application, may be obtained by addressing the Surgeon General of the Navy, Navy Department, Washington, D. C.

NOTICE OF A COMPETITIVE EXAMINATION FOR QUALIFICATION ON THE ELIGIBLE LIST OF CANDIDATES FOR POSITIONS AS STATE DISTRICT HEALTH OFFICERS IN THE MASSACHUSETTS STATE DEPARTMENT OF HEALTH.—Although the law leaves the appointment of District Health Officers in the hands of the Commissioner of Health, it is the policy of the State Department of Health to hold competitive examinations for this position and to consider the results of such examinations as the principal basis for selecting appointees.

On May 25 and 26, 1916, and on subsequent dates to be announced at that time, an examination will be held for the purpose of establishing an eligible list of appointments to positions as State District Health Officers of the Massachusetts State Department of Health.

The written examination will be held on the above dates in the examination room of the Civil Service Commission, No. 15, State House, Boston. The oral and practical examinations will be held on dates and at places announced at the time of the written examination.

There will be at least two appointments to be made from this eligible list in the near future. The eligible list established on the results of this examination will hold for at least one year.

Persons possessing the necessary qualifications and desiring to enter the competitive examination of this service are requested to communicate with the State Commissioner of Health, State House, Boston, at once. Upon such written application, a list of rules and regulations governing the appointment and promotion of District Health Officers and an application blank will be sent.

Admission to the examination is governed by the regulations accompanying this notice. Physical fitness is a necessary prerequisite, but no percentage credits are given on physique. The examination comprises written, oral and, if feasible, practical tests.

Relative rating on the eligible list is established on the basis of:

- Previous experience in public health work, both administrative and scientific—maximum 20 points.
- Results of oral examination—maximum 20 points.
- Results of written examination—maximum 60 points.

A. J. McLAUGHLIN,

Commissioner of Health.

April 12, 1916.

STATE DEPARTMENT OF HEALTH OF MASSACHUSETTS

Regulations Governing Appointment of State District Health Officers.

1. Grades of District Health Officers.—There shall be four grades of District Health Officers, viz.: A, B, C, and D.

2. District Health Officers appointed only to Grade D.—Candidates for the position of District

Health Officer, after passing a successful examination, shall be eligible for appointment to Grade D.

3. Form of application for appointment.—Candidates for the position of District Health Officer must make application addressed to the Commissioner of Health in their own handwriting, asking permission to appear before a Board of Examiners. Candidates shall state their age, date and place of birth, present legal residence, names of colleges or institutions of learning of which they are graduates, date of graduation, and shall furnish testimonials as to their professional experience and moral character.

4. Age Limit.—No candidate will be eligible to appear before a Board of Examiners whose age is less than twenty-three years or more than forty years. Candidates over thirty-five must have had at least three years' practical experience in public health work.

5. Professional Requirements.—Candidates shall be graduates of an incorporated medical school or shall have had at least five years' experience in public health work and sanitary science.

6. Citizenship.—All candidates must be citizens of the United States, and preference in appointment shall be given to residents of Massachusetts.

7. Physical Examination.—Candidates for appointment must pass a satisfactory physical examination before a Board of Examiners.

8. Board of Examiners.—The Board of Examiners shall consist of three or more members. These members shall be selected by the Commissioner of Health from the Public Health Council or other officials of the State Department of Health.

9. Scope of Examination.—All examinations of candidates for appointment as District Health Officer shall be conducted by a Board of Examiners and the examination shall include a physical examination and such oral, written and practical tests as the Board deems necessary in the subjects outlined in the succeeding sections. Experience and fitness shall also be rated by the Board of Examiners.

10. Subject for written examination.—All candidates for appointment must pass a satisfactory written examination in Communicable Diseases, Hygiene and Sanitation, Preventive Medicine, Vital Statistics, Pathology and Bacteriology.

11. Compensation.—The compensation of District Health Officers shall be as follows: Grade A, \$3500; Grade B, \$3000; Grade C, \$2500; Grade D, \$2000.

12. When promoted.—After six months' satisfactory service in Grade D, a District Health Officer is entitled to promotion to Grade C. After three years' satisfactory service in Grade C, a District Health Officer is entitled to examination for promotion to Grade B. After five years' satisfactory service in Grade B, a District Health Officer is entitled to examination for promotion to Grade A.

13. Examinations for promotion.—Examinations for promotion shall be conducted by a Board of Examiners, who shall take into account the efficiency record of the candidate as well as his professional and physical fitness. Failing first examination a District Health Officer may be given a second examination after one year. Failing two successive examinations, such a District Health Officer shall be dropped from the rolls.

14. Tenure of Office.—A District Health Officer may be removed from office by the Commissioner of Health because of failure to pass two successive examinations for promotion, or because of gross misconduct or inefficiency, but only after the accused officer has been furnished with a copy of the charges made against him and given a hearing thereon by the Public Health Council.

SOCIETY NOTICES.

MASSACHUSETTS GENERAL HOSPITAL.—A meeting of the Massachusetts General Hospital Clinical Society will be held Monday, May 8, at 7.30 P.M., in the Out-Patient Building Amphitheatre. Meetings are discontinued after this date until next fall.

SUBJECTS.

1. Demonstration of Cases.
2. "Chronic Inflammatory Disease of the Thyroid Gland," Dr. John S. Hodgson.
3. "The Etiology of Sterility," Dr. A. W. Reggio.
4. "The Control of Strychnia Convulsions by Intraspinal Injections of Magnesium Sulphate," Dr. B. H. Alton and Dr. Elliott C. Cutler.

The administrative and visiting staffs, physicians, surgeons and students are cordially invited.

ELLIOTT C. CUTLER, M.D., *Secretary*.

NORFOLK DISTRICT MEDICAL SOCIETY.—The sixty-sixth annual meeting will be held at the New American House, Boston, Tuesday, May 9. A business meeting will be held at 5.30 P.M. This will consist of the reading of the minutes of the previous meeting, report of committees, report of treasurer, election of officers and incidental business. At 6.30 dinner will be served. The entertainment committee will present a short play followed by a farce.

The Board of Censors will meet for the examination of candidates on Thursday, May 11, at 2 P.M., at the Roxbury Masonic Temple, 171 Warren Street, Roxbury.

The Treasurer will be at the meeting ready to receive the Annual Assessment of \$5.00. All members are urgently requested to pay at that time, or to forward the amount to him, instead of making payments at the meeting of the Massachusetts Medical Society in June.

BRADFORD KENT, M.D., *Secretary*,
798 Blue Hill Avenue, Dorchester.

RECENT DEATHS.

DR. CHARLES SINCLAIR STONE, a Fellow of the Massachusetts Medical Society, died at his home, 752 Tremont Street, April 22, aged 56 years. He was a graduate of the Harvard Medical School in the class of 1886, and had lived and practised in the same house for many years.

DR. J. WILLIAM WHITE of Philadelphia died of pneumonia on April 24, at the age of 66. He was a trustee of the University of Pennsylvania and well known as a surgeon and author.

DR. JOHN A. L'VON BETZEN, who died on April 23, at Battle Creek, Mich., had practiced dentistry in Boston for the past fifteen years. He was 47 years of age.

DR. GEORGE W. DERRICK, Health Officer of Norwood, and member of the Board of Health, died April 23 at the Brooks Hospital, Brookline. Dr. Derrick's hand was slightly injured by a needle point a week ago and blood poisoning followed. Dr. Derrick was born in Watch View, Conn., and was 38 years old. He was graduated from Tufts College in 1897 and from Tufts Medical School in 1901. He was a physician at the Rutland Sanitarium for some years. Dr. Derrick took a deep interest in athletics for boys and gave much assistance to the local high school teams.

DR. CHARLES R. DICKERMAN, who died on April 7 at Taunton, Mass., the son of a practising dentist in that city, had been a dental practitioner in his office for many years. He is survived by his widow, two daughters and two sons.

The Boston Medical and Surgical Journal

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Original Articles.

METHODS FOR TESTING DONORS FOR TRANSFUSION OF BLOOD AND CONSIDERATION OF FACTORS INFLUENCING AGGLUTINATION AND HEMOLYSIS.

BY GEORGE R. MINOT,* M.D., BOSTON.

[From the Medical Service of the Massachusetts General Hospital.]

Blood transfusion in recent years has become a common therapeutic procedure. Untoward results have been relatively few, even when donors were not selected by tests to avoid agglutination or hemolysis. Bad results have been more frequent perhaps when the patient was suffering with an obscure blood disease, than an acute secondary anemia. At one time it was thought that all untoward results were hemolytic or agglutinative, and could thus be eliminated if the recipient's blood caused no hemolysis or agglutination of the donor's, or *vice versa*. We now know that even after excluding the possibility of a hemolytic or agglutinative reaction, and excluding accidents such as loosening thrombi, introduction of too much blood, etc., that may follow transfusion, other reactions of unknown nature sometimes occur and more usually in patients with high fever, sepsis, or blood disease than in those with a secondary anemia. At present we have no means of determining when these reactions of unknown nature will occur.

* Dalton scholar of the Massachusetts General Hospital.

It is, however, well recognized that it is desirable to select for transfusion a donor, who is not only healthy and whose blood gives a negative Wassermann reaction, but whose plasma neither hemolyzes nor agglutinates the patient's red cells and whose cells are not hemolyzed or agglutinated by the patient's plasma. Moss,¹ Bernheim² and Ottenberg and Kaliski^{3,4} among others, have shown that the result of such reactions *in vitro* can be definitely taken as reliable evidence of what may happen *in vivo*, so far as hemolysis and agglutination are concerned. In order to determine if a donor is suitable we should have as simple and rapid a method as possible, to test blood for its power to agglutinate or hemolyze other blood. A consideration of methods for doing this and the action of the human hemolysins and agglutinins, will form the basis of this paper.

THE ISO-AGGLUTININS AND ISOHEMOLYSINS IN HUMAN BLOOD.

A hemolytic or agglutinative reaction occurring from transfusion of human blood is considered to be caused by the normal iso-hemolysins or iso-agglutinins;* and not to those caused by heterologous agglutinins or hemolysins, such as occur when blood of one species is transfused to another, or to immune agglutinins or hemolysins when blood containing these is involved in the transfusion.

* The prefix iso is used to designate that variety of agglutinin or hemolysin, which is effective against the red cells of another animal of the same species. Iso-agglutinins or iso-hemolysins may be normal: i.e., occurring naturally, or immune, resulting from injection of red cells of one animal into another of the same species. The iso-hemolysin is of a complement-ambocceptor nature.

Moss,⁵ especially, has shown that iso-agglutination frequently occurs without isohemolysis, but isohemolysis is always associated with iso-agglutination or preceded by it. Therefore, if one tests a serum or a plasma for its ability to agglutinate[†] red cells and it does so, it may or may not hemolyze them, but if there is no agglutination there will be no hemolysis.

It has been shown that all adult human beings can be divided into four distinct groups^{§,6} in regard to the ability of their red blood corpuscles to be agglutinated by other human sera or their sera to agglutinate other human red cells; it being generally considered that there is no auto-agglutination. Thus if two individuals belong to the same group, neither will agglutinate or hemolyze each other's red cells. Some of these groups are rarer than others, and the frequency of the different groups as given by Moss⁵ is similar to our experience.[§]

The group to which an individual belongs is an inherited characteristic which follows Mendel's^{8,10} law; an individual always remaining in the same group regardless of disease.^{5,7}

However, v. Decastello and Sturli²² and Langer²¹ have shown that in children under six months of age the iso-agglutinins in the serum may not be demonstrable, though the agglutinability of the red cells by the different sera is usually developed, but not always. Moss[†] and Happ[†] have shown that the group characteristic is established in the corpuscles before it is in the serum. They have also shown that the group may be established at birth, and that it is completely established in about 85% of children between one and two years of age, though it may not be established until ten years of age or more.

It should be noted that Ottenberg, Kaliski and Friedman⁸ have pointed out that if one transfuses agglutinable cells, the recipient may develop immune iso-agglutinins and would thus perhaps change the grouping to which he belongs.

It is stated that auto-agglutination may occur in the very rare condition acquired hemolytic jaundice, Hayem-Widal type. Some believe that auto-agglutination may sometimes occur in pernicious anemia, malaria and other diseases, though never normally, but the more recent authorities who have studied many cases consider that there is no auto-agglutination, with which I agree. Whether such an auto-agglutinin, if it actually ever does occur, can be differentiated

from the normal iso-agglutinins is not known, but this phenomenon should be thought of and not lead to confusion when the tests mentioned below are done. Rarely, and then only in pathological conditions, so that they do not affect the choice of a donor, autohemolysins occur which are distinct from and not to be confused with isohemolysins. Such autohemolysins occur in paroxysmal hemoglobinuria.⁷ In some cases of toxemia there occurs an autohemolysin, perhaps of a chemical nature. Such an instance is reported by Moss⁵ in a case of uremia, and I have seen the same in a mildly uremic patient. A patient whose blood contained such a hemolysin, though belonging to the same group as the donor, might be able to hemolyze the donor's cells, but probably no more so than his own.

USE OF GROUPS TO TEST DONORS.

The more usual method for testing donors for transfusion is to test directly the patient's serum or plasma against the donor's cells and *vice versa*. If no agglutination or hemolysis occurs *in vitro*, there will be no agglutination or hemolysis *in vivo*, and the two individuals must belong to the same group, though which group is not known.

The fact that all adult individuals belong to one of four possible groups so far as their agglutinins and hemolysins are concerned is of practical importance because one may determine the group to which a patient belongs, and then use as a donor one belonging to the same group as the patient. This enables one to test at different times and places donors and recipients without having to test directly the patient's blood against each prospective donor. For example, at the Massachusetts General Hospital we have determined the group to which a series of individuals belong who are willing to act as donors. When one wishes to transfuse a patient, his group is determined and a donor belonging to the same group is summoned and the transfusion may then be done without further tests and without fear of any agglutinative or hemolytic reaction taking place in the patient. Likewise as soon as a patient enters the hospital his group is determined if it is likely that he will be recommended for transfusion. Later, the group to which his friends belong is determined if their general health is such that they are suitable for donors. Then a friend belonging to the same group as the patient is used as a donor.

In view of the fact that the group to which an individual belongs may not be fully developed in children, one cannot always use this group method to test their blood, and in such instances the blood should be tested directly against the donor's. However, if the child's blood shows that it belongs to a definite group, which it is more apt to do if the child's corpuscles are used than serum, one may then of course use the group method.

⁵ In this paper agglutination and hemolysis refer to the normal iso-agglutination and isohemolysis, unless stated to the contrary.

[§] Moss^{5,7} characterizes the groups as follows:

Group I. Serum agglutinates no corpuscles. Corpuscles agglutinated by sera of groups II, III and IV and *vice versa*.

Group II. Serum agglutinates corpuscles of groups I and III. Corpuscles agglutinated by sera of groups III and IV.

Group III. Serum agglutinates corpuscles of groups I and II. Corpuscles agglutinated by sera of groups II and IV.

Group IV. Serum agglutinates corpuscles of groups I, II and III. Corpuscles agglutinated by no sera.

About 85% of all individuals belong to groups II and IV. Jansky⁹ also divided individuals into these four groups, but his group I corresponds to Moss' group IV and *vice versa*. Ottenberg refers to Jansky's numbering of groups and not Moss'. In this paper I refer to Moss' numbering of groups.

[†] Personal communication.

Moss¹² has shown that in order to determine the group to which an individual belongs, when his group is fully developed, it is only necessary to test the agglutinative action of his serum against the red cells of two certain known groups (groups II and III) or to test his red cells for their agglutinability by the serum of these same two groups.¶ If we test the patient's serum, we must have on hand individuals belonging to groups II and III, so that they may furnish a drop of blood to be used as a red cell suspension in the tests described below. Such a suspension will keep for about 48 hours. However, if one tests the cells from the patient, (a drop sufficing for the test), one must have on hand sera of the groups II and III, which if kept sterile will remain perfectly active for months, and requiring but two small drops for each test. It requires but 20 minutes to perform the tests as described below.‡

METHODS TO TEST ISO-AGGLUTINATION, USING SERUM AND CELLS.

It is desirable to have as simple and rapid a method as possible to test the iso-agglutinative action of the blood, there being no need to test the hemolytic, because hemolysis never occurs without agglutination, and even if there is no hemolysis of the patient's or donor's cells with each other's serum, agglutination itself is undesirable.

The methods for testing for iso-agglutination and hemolysis described by Moss,¹³ Epstein and Ottenberg,¹¹ and Weil¹² (method with citrated plasma) involve either one or more of the following undesirable features: large amounts of blood; a long time to do the tests, even over three hours; washing of red cells, and special glassware.

Moss' Method.

Of these tests, Moss'¹³ microscopic method seems the best, being the simplest and quickest. It may be used for testing to what group a patient belongs, or to test a donor's and patient's blood directly against each other. The test consists simply of mixing one drop of serum with one drop of an approximately one per cent. suspension of twice washed red cells, and observing microscopically whether agglutination takes place or not. The greatest objection to the technic for a simple test is that it necessitates washing the red cells.

¶ This is because the cells of each of the four groups act differently in regard to their agglutinability by the serum of groups II and III, and the serum of each of the four groups has a different effect as to whether it causes agglutination or not of the cells of groups II and III.

‡ Dr. Vincent has called to my attention that one may determine to what group a patient belongs (using both his cells and serum) if one has on hand serum and cells of only group II or group III. One may see how this is possible by referring to the characteristics of the different groups. For example: If an individual's cells agglutinate with group II serum, he belongs to group I or III. If group II cells are agglutinated by the individual's serum, he must belong to group III or IV. Previously we learned that the individual could belong to group I or III only, therefore, he cannot belong to group IV and must belong to III. Similarly it may be worked out for the other groups.

Simplification of Moss' Method.

However, I have found that the test may be perfectly satisfactorily done without washing these cells, the red cell suspension resulting from collecting a drop of blood in approximately one c.c. of a solution of 1.5% citrate in .9% salt solution being entirely satisfactory. Rous and Turner¹⁴ have recently shown that a small amount of citrate interferes in no way with agglutination and I have found the same, though with excessive amounts, over 7%, the agglutinative action of serum is weakened.

Though it is necessary only to test the individual's cells against the serum of the groups II and III, or the individual's serum against the cells of these two groups in order to determine the group to which he belongs; or to test reciprocally the cells and sera of patient and donor to determine if they belong to the same group; it is perhaps desirable to have controls of each individual's own cells and serum. Should rouleaux-formation of the red cells (see below) only occur and be mistaken for agglutination, it will occur in the controls as well as in the test specimens, for the ability of a serum to form rouleaux is not affected by the cells of the different groups or individuals. Likewise, should any auto-agglutination occur, it would be demonstrated.

Technic of the Microscopic Agglutination Test.

The technic of doing this microscopical agglutination test is simple. Thoroughly mix a drop of serum with a drop of red cell suspension and look microscopically for agglutination. It is preferable to use a hanging drop, though the two drops mixed on an ordinary slide with a coverglass over them is perfectly satisfactory provided that one remixes the cells and serum after 5 and 10 minutes by lifting the coverglass.

If agglutination is going to take place it will do so usually in a very few minutes, but it is, as pointed out by others, desirable to wait 15 or 20 minutes before deciding definitely that there is no agglutination. In some instances one may see the agglutinated masses macroscopically, but one cannot depend on this method for macroscopic readings. Sometimes besides seeing the agglutinated red cells, one will see hemolysis taking place. The appearance of the agglutinated red cells is quite characteristic. They appear in balled-up masses, clumped together in no regular order; sometimes all the cells are agglutinated into a few large clumps, or if the agglutinin is weaker, as many small clumps. Often one may be able to hasten the agglutination by tilting the slide or remixing the drop of cells and serum. Such procedures often allow larger agglutinated masses to appear.

The glassware used in doing the test must be clean, but not necessarily sterile. One must be careful not to handle the different sera or cell suspensions with the same pipette without very thorough washing.

Rouleaux Not to be Confused with Agglutination.

One must be careful to differentiate agglutination from rouleaux-formation of the red cells, *i.e.*, when red cells are piled on top of one another in an orderly fashion, like a pile of coins. In some instances rouleaux-formation may be very marked and appear, if hastily looked at, much like agglutination, but when examined more closely can be easily differentiated. Remixing the serum and cells will tend to break up rouleaux masses, while it tends to cause more agglutinated masses. Both rouleaux and agglutination may, of course, occur in the same preparation.

Sellards¹⁵ has pointed out that serum which has stood over 24 hours loses its power to form rouleaux; in rare instances I have seen a serum retain this property for three days. Thus, if one is using old serum for the agglutination test, rouleaux will not occur. Sellards has shown that this property of serum is greatly augmented by heating to 60° C. for one-half hour and by concentration of the serum; and that slight dilution causes this property of serum to be lost. Increasing the percentage of cells to serum increases the amount of rouleaux-formation.

In the agglutination test described above by diluting the serum equally with the approximately 1% red cells suspension, it usually prevents any rouleaux occurring, both because of the dilution and because of the small number of cells present.

Serum which has shown very active rouleaux-forming power has been obtained from two cardiac cases with marked broken compensation, and perhaps was due to a concentration of these patients' sera. If rouleaux-formation is marked, it appears macroscopically much like agglutination.

Methods of Obtaining Serum.

If one has serum previously collected, there will be no delay in determining the results of the tests, but if one must wait for serum to separate from the clot, there will be some delay. Should a centrifugalizing machine be at hand, there will be but little delay, for by centrifugalizing a previously loosened blood clot, serum will be quickly separated. If no centrifuge is at hand, serum can often be obtained in less than 30 minutes by collecting blood in a capillary pipette, separating the clot after it has formed from the sides of the glass, and waiting for serum to collect in the lower sealed-off end of the pipette. This procedure involves special glassware and care, for it is apt to result in stirring red cells into the separating serum.

I have found the following method useful to obtain serum quickly or when it can be obtained in but small amounts. Allow two drops of blood to dry on a glass slide, preferably concave, or a bit of concave tin such as is used for Widal's test. The dried blood is then redissolved in its

own volume of water, being careful to get it thoroughly into solution. This solution may then be used as serum. The presence of free hemoglobin does not interfere in any way with agglutination nor will strands of fibrin be mistaken for agglutinated masses of red cells. One cannot lake blood directly with water and use satisfactorily the resulting solution for serum, because, to prevent clotting taking place, it requires greater dilution than is desirable for the test. Such a solution can, however, be used to test for the bacterial agglutinins, as shown by Von Liebermann and Acél¹⁶, because they are active in much greater dilution than the iso-agglutinins.

Methods for Testing Iso-agglutination with Citrated Plasmas.

(A) *Rous and Turner's Method.* Rous and Turner¹⁴ have recently described a method for testing iso-agglutination, using mixtures of citrated blood, which is applicable to testing donor and patient, but is not entirely satisfactory to determine to which group an individual belongs. This method consists of making two and, if desired, three mixtures of citrated plasma, which are examined microscopically for agglutination. Blood is collected separately from the patient and donor in white counting pipettes, being diluted as it is drawn, with citrate solution, so that the resulting mixture contains about 1% of citrate. From these citrated specimens of blood, mixtures are made by means of capillary pipettes, as follows:

1. 9 parts of patient's citrated plasma with 1 of donor's.
2. 1 part of patient's citrated plasma with 1 of donor's.
3. 1 part of patient's with 9 of donor's (if desired).

After the mixtures have stood for about 15 minutes, a drop is placed on a slide and examined microscopically to see if agglutination has occurred or not. Though not necessary, it is desirable to add a drop of salt solution to the drop from the mixture, before looking for agglutination, so that the red cells appear more separated and one can see the agglutinated masses more easily.

If there is no clumping in the mixtures, the two bloods do not agglutinate, and will not hemolyze each other. If clumping occurs in the first mixture, and to a less degree in the second mixture, it is certain that the blood of the patient agglutinates, and may, perhaps, hemolyze the donor's. Clumping in the second mixture, with little or none in the first, indicates that the plasma of the patient agglutinates the cells of the recipient. Rous and Turner feel that, for practical purposes, the first two mixtures suffice, but if there is a desire to know if both bloods contain agglutinins, the third mixture should be made. If the first and the third mixtures show large clumps and the clumps are smaller

in the second mixture, two agglutinins must be present. Should there be only one agglutinin, little clumping, or none, will be observed when the blood containing the agglutinin is diluted with the nine parts of the other blood.

The reason that this test is not satisfactory for determining to which group an individual belongs is because of the possible presence of two agglutinins in one mixture. Though one, with care, may tell to which group an individual belongs by using citrated plasmas, it is apt to be confusing. Likewise, it would mean hunting up at the time of each test, individuals belonging to groups II and III.

This test is simple and may be done quickly, but the great difficulty is that the blood is apt to clot in the collecting pipettes. It also requires capillary pipettes to make the mixtures. The presence of non-agglutinable red cells, in the proportions in which they occur in the mixtures, does not interfere with being able to see the agglutinated masses. However, the clumps appear smaller than when simply cells and serum are mixed together.

(B) *Modification of Rous and Turner's Method.* I have found that this test may be performed without the need of accurately diluting the blood by white counters, so that the disturbing factor of clotting is done away with. One may get quick and satisfactory results by performing the test as follows:

Place 3 to 4 drops of a 1.5% citrate solution in .9% salt solution in a short (about 2 cm.) test tube, with a relatively large diameter (about 1 cm.); then collect in this tube 9 drops of blood from the recipient and one from the donor, and in another tube similarly collect 9 drops from the patient and one from the recipient. I prefer to use only these two dilutions, though one may also use a dilution of 1 drop from each individual, using two drops of citrate solution. The drops of blood are collected from a prick in the ear, trying to allow the blood to fall directly into the citrate, but it makes no difference even if the blood runs down the side of the glass. One does not need to have the drops exactly the same size, and the amount of blood does not need to be accurate, but approximate, the reason for which will be explained later. After the mixtures have been mixed by shaking, and have stood for about 15 minutes, one then takes out a drop and examines it microscopically for agglutination, as described above.

There is no reason why the citrated plasma cannot be collected separately by the above method, and the mixtures made from these, in which case one may have as a control, if one desires, the citrated plasma of each case.

SUMMARY.

One may determine in 20 minutes, at the longest, the group to which an adult patient belongs, if he has on hand serum (which retains its agglutinating power for months) of groups II and

III, by simply mixing separately one small drop of each serum with a small drop of a suspension of red cells from the patient (obtained by collecting one drop of blood in about 1 c.c. of a 1.5% of citrate solution in .9% salt solution), and observing microscopically the presence or absence of agglutination in the two preparations after 15 or 20 minutes.

If, instead of serum, one has on hand corpuscle suspensions, of the two groups, II and III (requiring but a drop of blood in about 1 c.c. of the citrate solution for each suspension), one determines the group to which the patient belongs according to the presence or absence of agglutination in the two preparations, made by mixing a small drop of his serum with a small drop from each of the two known red cell suspensions.

In children the group may not be established. If the group is not established, a direct test between donor's and patient's blood should be made.

If it is desired to test directly the agglutinability, and thus the possible hemolytic action, between the blood of the patient and of the donor, the simplest and quickest method, requiring at the most, slightly over 20 minutes, is the method described above, requiring approximate amounts of citrated blood, not over ten drops from each individual, collected directly into a tube containing citrate solution.

Controls of each patient's serum and cells, or his own plasma and cells, are not strictly necessary, but desirable if one is not accustomed to doing the test, or thinks auto-agglutination may occur.

By using the methods described above, one can determine in 20 minutes if a donor is suitable; this short time is desirable, as transfusion is often an emergency operation.

Likewise, the test may be done with very little blood, which is convenient when blood is difficult to obtain.

The tests require no special apparatus,—a needle, test tubes, citrate solution, anything to pick up a drop of serum and cells with, glass slides and cover glasses, and a microscope are all that are required.

Factors Preventing Agglutination and Hemolysis and Consideration of Type of Donor That is Able to Cause the Severest Agglutinative or Hemolytic Reaction.

It is desirable to point out certain phenomena about iso-agglutination and isohemolysis that have been emphasized by others, and help explain why bad results do not always occur when transfusion is done between individuals of different groups.

Ottenberg¹⁷⁻¹⁸ states that transfusion of agglutinable blood may produce, but often does not produce, bad results. This is because of three factors,—interference with agglutination by an excess of non-agglutinable cells, absorption of the agglutinin by the agglutinable cells, and concentration of the agglutinin.

Transfusion between members of different groups may not always cause hemolysis, first, because isohemolysins are not always present, occurring in but about 20% of sera that are agglutinative. Secondly, if isohemolysins are present, the effect of an anti-hemolytic substance (which occurs in any blood with cells that can be hemolyzed) is a factor to prevent hemolysis. A third factor is a certain amount of absorption of the hemolysin by the cells that can be hemolyzed. Of course, the concentration of the hemolytic and anti-hemolytic substances and their quantitative relation comes into play in determining whether hemolysis will occur or not. If there is a very strongly hemolytic serum or an insufficient amount of anti-hemolytic serum, or both, hemolysis will probably occur.

It is generally accepted that it is more dangerous to transfuse a patient with agglutinable cells than with agglutinative plasma, because if agglutinative plasma is put into a patient, not only is it diluted, but it meets with an excess of agglutinable cells, which absorb the agglutinin, and thus allow either no clumping to take place, or but a few very small clumps to form. There have been no bad results reported in cases known to have been transfused with this type of plasma. If one cannot obtain a donor whose blood is of the same group as the patient's, one can then use with probable safety a donor whose serum is agglutinative for the patient's red cells. It is, however, wiser not to do this if it can be avoided, and is to be recommended only when a proper donor cannot possibly be found, but is, nevertheless, to be greatly preferred to a donor whose cells are agglutinated by the patient's serum.

When one transfuses agglutinable cells which meet with an excess of agglutinative serum, bad results sometimes occur. It is in such instances that phagocytosis of the foreign red cells by the patient's leucocytes is reported. Even if there are no untoward symptoms in the patient, at least some of the cells transfused, if not all, are agglutinated, and may thus perhaps be hemolyzed. Transfusion of this sort would probably not be as beneficial as if a proper donor was used. In such instances the red cell destruction may act to stimulate the production of new blood by the bone marrow, and in this way aid the patient. This has been pointed out by others, and I have seen a case of Dr. Vincent's respond in this manner.

Moss¹³ has pointed out that one is, perhaps, more apt to have bad results when transfusion is done between two individuals each of whose serum is agglutinative to the cells of the other, for in such an instance we have two agglutinative phenomena, and may thus have two hemolytic processes taking place in the body at the same time. This possibility can occur only when transfusion in either direction is done be-

tween groups II and III, and fortunately group III is rare.

The protective mechanism against hemolysis is different from that against agglutination, but the donor that is the most dangerous on account of agglutination is, likewise, the most dangerous on account of hemolysis. Again we see that isohemolytic action follows after the agglutinative, recalling that hemolysis does not always occur if agglutination does, but that it never occurs without agglutination. However, a hemolytic reaction in the body is probably more serious than only an agglutinative one.

It has often been shown that plasma belonging to the cells that can be hemolyzed contains an anti-hemolytic substance. Thus when we transfuse hemolytic plasma, not only is it diluted by the recipient's blood, thereby rendering it less active, but it meets with an excess of plasma that has anti-hemolytic properties and an excess of cells able to absorb the hemolysin, so that hemolysis does not take place. When transfusion has been done with this type of plasma no severe reactions have been reported. When the reverse type is used, severe hemolytic reactions have occurred, though not always. Hemolysis, in such instances, may occur, because with the entrance of cells capable of being hemolyzed into the patient's blood, this blood containing an excess of hemolytic plasma, there enters relatively little anti-hemolytic substance, and what does enter becomes diluted in the patient's blood and, therefore, less efficient.

It seems that in the first instance, when hemolytic plasma is transfused, that if there was no anti-hemolytic agent in the recipient, and the hemolysin was very strong, one might get a severer reaction than in the second instance, where hemolysable cells are transfused, because there would be more cells to be hemolyzed. However, in the cases that have been studied, the severest reactions occur in the latter and not in the former instance.

Factors Influencing Agglutination.

(A). *Excess of Non-agglutinable Cells.* An excess of non-agglutinable cells¹⁷⁻¹⁹ causes smaller agglutinated masses of red cells, and the presence of a non-agglutinating serum causes smaller clumps to form than when salt solution is present; thus in the body much smaller clumps are formed than *in vitro*, when serum and agglutinating cells are mixed, so that embolism becomes unlikely, even if there should be agglutination.

(B) *Absorption of Agglutinin by Agglutinable Cells.* The agglutinin is absorbed by the agglutinable cells before agglutination occurs (Hoekten,¹⁹ Ottenberg¹⁷), so that if there is an excess of cells they will absorb all the agglutinin, and no agglutination will take place. Ottenberg¹⁷ states that if the proportion of agglutinating sera to agglutinable cells is 1 to 4, no agglutination occurs, as there is only enough agglutinin to be absorbed by the cells, and not

enough left over to produce agglutinated masses. In some instances I think that agglutination will not occur if the proportion is 1 to 1, and perhaps even if 1 to 2. However, it is not infrequent to find that one must have the proportion often 1 to 1 and not infrequently 1 to 3 before the agglutinated masses can be easily seen and identified. The more agglutinable cells there are in proportion to agglutinating serum the smaller the clumps appear. On the contrary, I think some sera may show agglutinating ability when its proportion to agglutinating cells is as little as 1 to 10 and perhaps 1 to 15. Such variation would depend on the ability of cells to absorb agglutinin and the concentration of the agglutinin.

From the above, one may see why in the tests with citrated plasma it is necessary only to have our proportions approximate; we may have at least 4 drops less than 9 of one blood to one of the other, and still not alter the results. One may have, of course, less than 1 drop to 9 and also not alter the results, provided one realizes that the agglutinated masses will be fewer in number. Even if one has but 1/2 drop to 9, there will be enough clumps to be easily seen.

(C) *Concentration of the Agglutinin.* The concentration of the iso-agglutinins is generally considered weak as compared to the bacterial agglutinins. There are a few figures in the literature as to their concentration in health and disease. They vary normally, and disease apparently does not affect their concentration. Ottenberg¹⁷ states that they occur in dilutions of 1/20 to 1/30, Landsteiner and Leiner²⁰ found them in dilutions of 1/20 to 1/100, and Langer²¹ in dilutions of less than 1/25. Hockten¹⁹ found them in greater dilution, but no greater in 3 cases of typhoid, 3 of tuberculosis, 1 of pneumonia, 1 of scarlet fever, and 1 of serum disease, than in 4 normals, but in one case of serum disease the iso-agglutinin was about four times as strong as in any of these other cases.

I have tested in a few instances the strength of the iso-agglutinins, using .5 cc. of various dilutions of serum and .05 c.c. of a 5% suspension of red cells, looking microscopically for agglutination after one hour. I found that normally they may be demonstrated in a dilution of 1/30 to 1/160, usually in a dilution of 1/60 or 1/80. Normally the strength of the agglutinins in the sera of the different groups seems to vary, as has, likewise, been noted by Moss,[†] that of group IV seems to be the strongest and group III probably the weakest. The cells of the different groups and cells of individuals of the same group are often unequally agglutinated by the same serum.

The strength of the agglutinin in the serum of a few diseased individuals (1 typhoid, 2 pneumonias, 2 nephritis, 1 secondary anemia, 1 arthritis, 2 pernicious anemias, 1 congenital

family jaundice) was tested and found not to vary more than in normal people, with one exception. This exception was the case of congenital family jaundice, whose serum showed agglutinability in a dilution of 1/320. It has been suggested by some that the formation of the iso-agglutinins depends on the reabsorption of one's own blood, the constant destruction of which is going on in the body. It was thus thought that perhaps diseases with increased blood destruction, such as pernicious anemia and family jaundice, might have a greater concentration of the iso-agglutinins. This assumption does not seem to be true, for though the case of family jaundice did have a slightly greater concentration than the few other individuals tested, the two cases of pernicious anemia that were tested did not.

Factors Influencing Hemolysis.

(A) *Concentration of the Hemolysin.* At present I have not had the opportunity to test the concentration of the hemolysin, except in a very few instances. It apparently varies considerably, being demonstrable in one instance in a dilution of 1/5 and in another in a dilution of 1/150. Usually it has been demonstrable in dilutions of 1/10 to 1/20. In an instance where the recipient's serum hemolyzed the donor's cells in the test tube and clinically there was hemolysis taking place in the body, there was not only an extremely weak anti-hemolytic action of the donor's serum, but the hemolysin in the patient's serum was concentrated and demonstrable in the dilution of 1/150.

(B) *Absorption of the Hemolysin by the Hemolyzable Cells.* This action of the hemolyzable cells is somewhat similar to the ability of agglutinable cells to absorb agglutinin so that an excess of cells acts in a certain degree to protect against the hemolysin.

(C) *Concentration of the Anti-Hemolysin.* The strength of the anti-hemolytic substance varies greatly. I have found in some instances that a fifth part of neutral serum contains enough anti-hemolytic substance to prevent completely hemolysis, while 1.5 parts of another neutral serum will barely diminish the amount of hemolysis caused by the same hemolytic serum. Though an anti-hemolysin exists, there is no anti-agglutinative substance, except possibly in some instances an exceedingly weak one.

It seems that perhaps it would be wise to test the anti-hemolytic property of serum, should one have to use a donor of a different group than that to which the patient belonged. A case* transfused by Dr. Vincent belonged to the rare group III. No donor of group III could be obtained, and the cells of several donors were actively hemolyzed by the patient's serum, and their serum was weak in anti-hemolysin. Another donor, though his cells were hemolyzed by the patient's serum, was considered a relatively

[†] Personal communication.

* The tests for this case were made by Dr. Robertson and Dr. Lee.

safe donor because of a large amount of anti-hemolytic substance in his serum. Transfusion was done from this donor, without any reaction in the patient. On the contrary, Ottenberg⁸ noticed in a dog that, though there was demonstrable in the test tube strong anti-hemolytic action, the same bloods in the body caused severe hemolysis. What happens *in vitro* in regard to anti-hemolytic action should not perhaps always be taken to indicate what may happen *in vivo*.

SUMMARY AND CONCLUSIONS.

A donor for transfusion of blood should be not only healthy, but should belong to the same iso-agglutination group as the recipient.

Simple and quick methods for testing this have been described.

What these tests show *in vitro* can be taken as reliable evidence as to what may happen *in vivo*, so far as agglutination and hemolysis are concerned.

Even when donor and patient belong to the same iso-agglutination group, there may occur, however, after transfusion, reactions of unknown nature, which are probably of not so severe or serious a nature as hemolysis.

Agglutination often does not occur *in vivo*, and if it does, does not always cause a severe reaction because of the following three factors, which have been discussed: interference with agglutination by an excess of non-agglutinable cells, absorption of the agglutinin by the agglutinable cells, and the degree of concentration of the agglutinin.

Hemolysis does not always occur *in vivo*, when donor and recipient belong to different iso-agglutination groups, because but about 20% of sera that are agglutinative are hemolytic. Hemolysis, however, never occurs without being preceded by or associated with agglutination.

If hemolysins are present in the plasma of donor or recipient, or both, hemolysis may not occur, or may cause but a slight reaction *in vivo*, because of the following factors and their quantitative relation to each other: concentration of the hemolysin, concentration of the anti-hemolysin, and a certain degree of absorption of the hemolysin by the hemolyzable cells. In discussing these factors, it was pointed out that in certain instances the knowledge of the strength of the anti-hemolysin might be of value.

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For references to the earlier work on the human iso-agglutinins see Landsteiner and Leiner and also Langer.

OBSERVATIONS ON THE USE OF THE DUODENAL TUBE FOR DIAGNOSIS AND TREATMENT.*

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(Continued from page 636)

USE OF THE TUBE IN DIAGNOSIS.

Einhorn, Gross, Frank, Bondi, Okada and Crohn in the last five years have described the use of the duodenal tube for diagnosis in adults, and Hess and others its use in infants. In our cases the tube was introduced by the rapid or slower methods already described. Duodenal juice was taken one to two hours after a drink of clear tea with sugar, to stimulate secretion. It was aspirated with a syringe or rubber bulb and examined for ferments, bile and sediments after noting its color appearance, and reaction to litmus. If not examined at once it was kept on ice a few hours. The Gross-Fuld test was used for trypsin, the Wohlgemuth test for amylase, and the ethyl butyrate test for lipase.

On the advice of Professor Folin of the department of biological chemistry at Harvard, and of Professor Mendell of Yale, these ferment tests were chosen as being decidedly more accurate and satisfactory than the use of Metts tubes as described by Einhorn.

Delicate chemical tests for blood seemed out of place.

The technic of the tests was as follows

In the test for trypsin we determined what dilution of the duodenal juice would completely digest 10 c.c. of the 1-10% casein solution in one hour in a water bath at 37° C. One c.c. of duodenal contents was diluted with 99 c.c. of water. In several test tubes were placed 0.1 c.c., 0.2 c.c., 1.0 c.c. and 2.0 c.c., respectively of the diluted contents. To each tube was added 10 c.c. of a 1-10% alkaline casein solution. The dilutions were 1-10,000, 1-5,000, 1-1,000 and 1-500, respectively, of the duodenal juice. In cases of suspected pancreatic disease dilutions of 1-100 and 1-10 were made. After one hour's digestion a little 1-2% acetic acid was added to each, to precipitate undigested casein. Under normal

* Read at the thirtieth annual meeting of the Association of American Physicians, Washington, D. C., May 11, 1915.

conditions the 1-10,000 dilution usually became cloudy with undigested casein and the other three dilutions remained clear. Occasionally the 1-5000 dilution became slightly cloudy. Clouding of the 1-1000 or 1-500 dilution showed absence or very marked diminution of trypsin.

In the test for lipase we determined the acidity developed by the digestion of 1 c.c. of ethyl butyrate by 1 c.c. of undiluted duodenal juice in 24 hours at 37° C., in terms of c.c. of $\frac{N}{20}$ NaOH.

Into each of two test tubes was placed 1 c.c. of duodenal juice. One was boiled for control. To each tube was added 1 c.c. of neutral ethyl butyrate, 10 c.c. of distilled water and 1 c.c. of toluene. These were placed in an incubator at 37° C. for 24 hours, then both titrated with $\frac{N}{20}$ NaOH, using phenolphthalein as indicator. The result in the control tube was subtracted from the other to give the final result.

In the test for amylase we determined the number of c.c. of 1% starch solution digested by 1 c.c. of duodenal juice in one hour at 37° C. In each of five small test tubes were placed 5 c.c. of a 1% starch solution. One c.c. of the duodenal juice was diluted with 1 c.c. of water, and 1.0 c.c., 0.5 c.c., 0.2 c.c., and 0.1 c.c. of the diluted juice were added respectively to four of the test tubes. The fifth tube served as a control. The tubes were incubated at 37° C. for one hour and then tested for undigested starch with Lugol's solution. The last tube of the series which failed to react was the one from which the reading was taken. The ferment activity is expressed in the number of c.c. of starch solution 1 c.c. of undiluted juice can digest. If it takes 1 c.c. of juice to digest 5 c.c. of starch the activity is 5; if digestion is accomplished by 0.5 c.c. it is 10, etc. The activity figures for the four tubes diluted as above are 10, 20, 50, and 100.

In only seven out of fifty-six cases did we fail to get duodenal juice for examination. We could not get the tube into the duodenum in three cases on account of pyloric obstruction, and in one case on account of marked gastroptosis and atony; in three cases the tube plugged persistently with mucus and the attempt was given up. In most cases aspiration was prompt and easy. In a few, careful technic and repetition of aspiration, or washing out of the tube were needed. The tube is as safe as the ordinary stomach tube, perhaps safer, and is much less disagreeable. Gentle aspiration never gave trouble. The duodenal juices were tested as controls in a series of normal and miscellaneous cases including cases where the tube was used for treatment. The results are tabulated.

The color was usually yellow, golden or greenish and its chief value was to indicate the presence or absence of bile. The juice was usually clear, but often cloudy in cases without known disease of the duodenum or bile passages, and was usually cloudy in diseases of the liver or

pancreas. The reaction was usually neutral or slightly alkaline but often was slightly acid from the presence of gastric juice. It is often stated that the reaction in the duodenum is alkaline; this is not the case. The reaction depends on the combination of alkaline, pancreatic and intestinal juices with the acid gastric secretion. They may neutralize each other and there is occasionally an excess of acid.

Gross blood was found only in two cases of cancer of the pancreas.

Tests for bile have little value; various tests were used, modifications of Huppert's and Rosin's tests, without getting accurate results. The simple tests were rough, the elaborate tests little better. Practically, as much could be told by the color of the duodenal juice as by the tests. For this reason we have recorded the color and appearance of the juice but not the results of the bile tests.

A positive test for bile in the duodenal contents is the surest and best proof that the ducts are, at least, partly open. A negative test for bile cannot be taken as absolute proof of closure of the ducts owing to the unsatisfactory nature of the present tests.

The results of the ferment tests showed much apparent variation in different cases and from day to day in the same cases.

There are several factors which account for this: first the variation in the reaction of the juices; second, the dilution of the pancreatic juice with the gastric juice and with more or less bile, and, third, the lack of strictly quantitative methods of analysis.

On this account only marked diminution or absence of ferments has value in diagnosis.

Our results are, in general, in agreement with those of previous observers. It is unfortunate that details of analyses and methods of recording results by different men vary so much that there is some difficulty in comparing their results. Some of the apparent accuracy of tables of ferment analyses is really fictitious.

The three ferments, trypsin, amylase and lipase usually varied together, but of the three, trypsin was the most constant and reliable, the lipase next and the amylase last, the latter being occasionally absent when the other ferments were normal in cases without known pancreatic disease.

In Einhorn's cases trypsin was occasionally missed when other ferments were present; I believe this is due to the use of a less accurate method.

In our cases tests for all three ferments were made for completeness, but for clinical purposes the test for trypsin has far the greatest value, and it seems as if the examination might be simplified by omitting tests for the other two ferments without losing much. Amylase and lipase were never both present when trypsin was absent.

Examination of the sediment usually proved of little value.

DISEASES OF THE PANCREAS.

The examination of the duodenal juice is the most direct and valuable test of the pancreatic secretion. It is easy in most cases to get the juice for examination, and the results are apparently quite accurate, far more so than in other tests. It avoids the many variable factors and great technical difficulties in the use of other methods such as the Sahli glutoid capsule and Schmidt's nuclear tests, the use of the oil test meal, tests of the feces for ferments, and other indirect methods.

It is better to examine the duodenal contents for pancreatic ferments rather than the feces; in the same way it is better to test the stomach contents for rennet and for pepsin rather than the stool. In the feces we have pancreatic ferments mixed with non-pancreatic ferments such as bacterial, leukocytic and other cellular ferments, as well as intestinal lipase and erepsin. In addition we cannot tell how much pancreatic ferment has been absorbed or used up in the small intestine.

In our cases (with one exception) adults without known pancreatic disease all had active trypsin, or to put it another way, *constant* marked diminution or absence of trypsin was found (with one exception) only in known pancreatic cases of which we have six, four cancer, diagnosed by operation or autopsy, two chronic indurative pancreatitis diagnosed, one by autopsy and one by characteristic history, feces, and physical examination. We have included only proved cases of pancreatitis in our series. We consider the mere "feeling a rather hard gland" by the surgeon at operation as very poor evidence.

Chronic jaundice, cachexia and chronic ill health may lessen secretion somewhat, but rarely below normal limits. A negative test has definite value in diagnosis; a positive test (presence of ferments) does not rule out pancreatic disease. In two cases of cancer of the pancreas with palpable tumor, ferments were present.

In one or two pancreatic cases the absence of ferments was clearly shown by ordinary chemical and microscopic examination of the feces after the Schmidt-Strassburger test diet. In others, particularly where jaundice was present, the tests of the duodenal juice were much more definite.

We must admit that pancreatic cases with little loss of function are very hard to diagnose by any method and that cases with very marked loss of function are often obvious without any very special tests, but between these is a wide middle ground where the duodenal tube is the most accurate and valuable method of diagnosis.

Einhorn's elaborate classification of five varieties of pancreatic secretion, normal, increased, diminished, disturbed and variable pancreatic

secretion (eu-, hyper-, hypo-, dys-, and hetero-pancreatism) determined by analyses of the duodenal juice does not rest on a firm basis for the reasons given above. The Metts tubes, which he has largely used, are convenient and useful for qualitative tests but unreliable for quantitative work.

DISEASES OF THE LIVER.

Here the use of the tube has less clinical value. It is probably the best method we have of deciding whether the bile passages are completely or partly closed, by noting the presence or absence of bile in the duodenal juice. Unfortunately this value is much limited by the lack of a good test for bile. Positive tests have value; negative tests are doubtful.

The presence of bile in the duodenal juices is the best proof we have that the common duct is, at least, partly open. Several times bile was found in the duodenal juice when there was none in the feces. In most of the normal and miscellaneous cases, bile was present. In most of the benign diseases of the liver such as gall-stones, cholangitis, and cirrhosis even when jaundiced, bile was also present. In most of the cases of cancer involving the bile passages bile was not found. In short, we may say in the jaundiced cases, that the presence of bile in the duodenal juice favors benign disease, and repeated absence favors malignant disease. There are so many exceptions, however, that the test has little value in the diagnosis of the individual case.

Our cases are too few for conclusions. Crohn, from a larger experience, has found bile almost always present in impacted gall-stones even with long jaundice, and almost always absent in jaundice due to growth and, therefore, concludes, that complete absence of bile from the duodenal juice is a valuable sign of local cancer. We cannot agree with this on account of the variability of the bile tests in the duodenal juice.

In normal cases not much sediment or flaky mucus is found; we usually got a ropy, greenish fluid which may be clear or cloudy; on the other hand, in cholecystitis or duodenitis we have sometimes found turbidity, mucus, or pus cells; gall-stone sand was found in one case of gall-stones. These signs have seemed rather uncertain guides in diagnosis, and, as in diseases of the stomach, I believe sediments have minor importance.

DISEASES OF THE STOMACH.

I have used the duodenal tube frequently for obtaining stomach contents in place of the usual stomach tube. It takes about a minute longer to get in than the usual stomach tube which can be quickly pushed down, but once past the larynx it is far more comfortable and the patients sit quietly as long as desired while the stomach contents is aspirated. It can be obtained and used for examinations of the gastric secretions at intervals of 15 or 20 minutes according to the method of Rehfuess.

The tube does not kink or curl up like the ordinary stomach tube, but sinks to the bottom of the stomach in the erect patient and is more reliable than the usual stomach tube for aspirating small amounts of clear fasting contents. Occasionally it blocks with food or mucus.

The pancreatic ferments in the miscellaneous stomach cases were normal save in two cases. One case of gastric neurosis showed almost complete absence of ferments on the first examina-

tion and normal ferments on the second. One case of chronic gastritis showed almost complete absence of ferments on two examinations. I have no satisfactory explanation.

It is worth noting that in three cases of achylia gastrica the pancreatic ferments were normal. This accords with previous data in showing how little pancreatic secretion depends on gastric acidity.

TABLE OF ANALYSES OF DUODENAL SECRETION.

No.	Disease.	Amount.	Appearance.	Color.	Reaction.	Trypsin.	Lipase.	Amylase.
<i>Normal and Miscellaneous.</i>								
1.	Normal	19	Cloudy	Golden	Neutral	1/1,000	0.4	20
2.	"	5	Clear	"	"	1/500	0.6	20
3.	"	20	"	"	"	1/5,000	2.4	20
4.	"	15	"	"	"	1/5,000	1.2	50
5.	"	20	"	"	"	1/500	2.6	20
6.	Tuberculosis lungs	10	"	"	Sl. acid	1/5,000	2.9	0
		12	"	"	"	1/1,000	3.6	0
7.	Neurasthenia	10	Cloudy	"	"	1/5,000	0.7	10
		25	"	"	Neutral	1/10,000	1.5	20
8.	Neurasthenia	10	"	"	"	1/5,000	1.7	10
		12	"	"	Sl. acid	1/1,000	2.0	0
9.	Pernicious anemia	25	Clear	"	Neutral	1/1,000	2.5	10
		17	"	"	"	1/5,000	1.5	50
10.	Chronic arthritis	19	"	"	Sl. alkaline	1/5,000	0.9	20
		7	Cloudy	"	"	1/1,000	0.9	100
11.	Chronic appendicitis	30	"	"	Neutral	1/1,000	9.6	50
12.	Nervous vomiting	10	Clear	"	"	1/5,000	3.9	20
13.	Nervous Vomiting	14	"	"	"	1/5,000	4.5	50
14.	Constipation	24	"	"	"	1/1,000	2.0	10
15.	Constipation	24	"	"	"	1/5,000	4.0	50
<i>Diseases of the Stomach.</i>					Reaction to Litmus.			
16.	Chronic gastric ulcer	20	"	"	Neutral	1/1,000	0.4	100
		15	"	"	"	1/5,000	0.7	0
17.	Chronic gastric ulcer	20	"	"	"	1/5,000	0.4	100
		7	"	"	Sl. alkaline	1/10,000	0.5	100
18.	Duodenal ulcer	7	"	"	Neutral	1/5,000	1.2	0
		5	"	"	Sl. alkaline	1/1,000	0.7	10
19.	Gastric ulcer	27	Cloudy	Yellow	Sl. acid	1/10,000	0.4	0
		30	"	"	"	1/10,000	0.3	20
20.	Duodenal ulcer	15	Clear	"	Neutral	1/10,000	2.4	20
		10	"	"	"	1/10,000	2.0	20
21.	Gastroptosis	12	"	"	"	1/1,000	2.0	0
22.	Gastroptosis	9	"	"	"	1/5,000	1.0	10
23.	Gastric ulcer	7	Cloudy	"	"	1/5,000	0.5	100
24.	Chronic gastritis	3	Clear	Yellow	"	1/1,000	2.4	50
25.	Gastric atony	10	Cloudy	"	"	1/10,000	0.9	50
26.	Gastric atony	20	Clear	"	"	1/1,000	3.5	50
27.	Gastric neurosis	5	"	Golden	"	0	0.2	0
		14	"	"	"	1/5,000	4.7	20
28.	Gastric neurosis	10	"	"	"	1/10,000	3.7	20
29.	Chronic gastritis	35	"	Yellow	"	1/1,000	5.0	20
30.	Chronic gastritis	15	Cloudy	"	"	0	0	0
		13	"	"	"	0	1.9	0
31.	Achylia	15	Clear	Golden	Neutral	1/5,000	1.2	50
32.	Achylia	25	Cloudy	"	"	1/10,000	1.5	20
33.	Achylia	30	"	"	"	1/1,000	9.5	50
<i>Diseases of the Pancreas.</i>								
34.	Cancer of head*	5	"	Yellow	Alkaline	0	0	0
		8	"	"	"	0	0	0
35.	Chronic pancreatitis	8	Sl. cloudy	Yellow	Neutral	0	0.4	0
		19	"	Gray	"	0	0	0
36.	Cancer of head*	30	Cloudy	"	"	1/10,000	1.5	50
		2	"	"	"	1/10,000	1	20
37.	Cancer of head*	10	Sl. cloudy	Yellow	Alkaline	1/10,000	2.1	50
		30	"	"	"	1/5,000	3.1	20
38.	Chronic pancreatitis*	17	"	"	Neutral	1/1,000	2.2	0
		13	Clear	Golden	"	1/1,000	2.0	0
39.	Cancer of head†	19	Cloudy	Watery	"	0	0	0
		8	"	"	"	0	0	0

Diseases of the Liver.

40. Cancer of gall-bladder*	10	Cloudy	Yellow	Sl. acid	1/1,000	1.6	0
	5	"	"	"	1/500	1.5	0
41. Catarrhal jaundice	9	"	"	Neutral	1/1,000	0.2	100
42. Alcoholic cirrhosis	10	"	"	"	1/1,000	0.2	20
	14	"	"	"	1/1,000	—	100
43. Alcoholic cirrhosis	15	Clear	"	Sl. alkaline	1/10,000	1.6	100
44. Catarrhal jaundice	10	Cloudy	"	Neutral	1/10,000	0.0	100
	30	"	"	"	1/10,000	—	50
45. Gall-stones*	20	"	"	Sl. acid	1/5,000	0	20
	50	"	"	"	1/1,000	8	50
46. Gall-stones*	30	Cloudy	Greenish	Neutral	1/10,000	3.5	50
	31	Clear	Golden	"	1/5,000	0.5	10
47. Gall-stones*	15	"	"	"	1/10,000	0	50
	12	"	"	"	1/10,000	3	50
48. Cancer of gall-bladder*	10	Cloudy	Yellow	"	1/5,000	1.5	50
	6	"	"	Sl. alkaline	1/1,000	1.5	50
49. Cancer of bile ducts†	8	"	"	Neutral	1/500	0	0

* Operation.

† Autopsy.

(To be continued.)

GASTRIC ULCER EXPERIMENTALLY PRODUCED BY MEANS OF THE STAPHYLOCOCCUS ORGANISM: A PRELIMINARY NOTE.

BY EDGAR C. STEINHARTER, B.S., M.D.,
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[From the Laboratories of the Cincinnati General Hospital.]

THE purpose of this note is to record briefly some observations relating to the production of gastric ulcers by means of the staphylococcus organism and a decinormal solution of acetic acid. The organism was obtained from a case of septicaemia in man. At first cultures of it injected intravenously into rabbits were found to produce a septico-pyæmia, but later, after cultivation in the wall of the living stomach of the rabbit, it showed on intravenous injection an affinity for the intestinal tract, locating most often in the appendix and occasionally in the stomach. Cultures from foci in different organs were made on agar and in aseptic dextrose broth, and from these growths, standard emulsions were made as follows:

An emulsion from the agar growth was prepared by suspending a 24-hour-old culture on agar slant in 10 c.c. normal saline; and from the broth by suspending in 15 c.c. of saline the centrifuged sediment of a 24-hour-old 150 c.c. broth growth. The dose of the emulsion was from one-quarter to 1 c.c., and of the acid 1 c.c. The materials in all cases were introduced through a hypodermic needle. When a local injection into the stomach wall was given, it was preceded by a laparotomy and the injections were always made into the pyloric end of the stomach. When both acid and emulsion were employed locally in the same stomach, the injections were made about one-quarter of an inch apart. Rabbits were used in all experiments and killed with ether at different times, ranging from one to six days. Postmortems were made,

when possible, immediately after death of the animal.

Based on the study of 40 injected animals, the following statements are made. A full report will be published later.

1. Typical peptic ulcers varying from one-quarter of an inch to one inch in diameter were produced by injecting locally into the stomach wall the staphylococcus organism of certain grades of virulence and a weak acetic acid solution. (See Figs. 1, 2 and 3). All staphylococ-

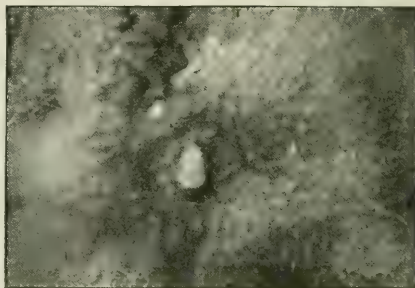


FIG. 1.—Pyloric end of stomach showing early stage of ulcers.

cus cultures would not answer the purpose—an organism of special virulence (for instance, one freshly isolated from the appendix) was necessary to produce the lesion.

a. The injection of the organism alone usually caused the development of a small localized and firmly walled off abscess at the point of injection. Such an abscess, as a rule, was absorbed in the course of four to six days and never showed any involvement of the mucous or peritoneal coats. In some cases no abscess was formed.

b. The introduction of the acid alone into the stomach wall beyond causing more or less oedema provoked no gross pathological change in the tissues. It certainly never caused an ulcer; but it did seem to increase the susceptibility

of the area for localization of the staphylococcus injected into the general circulation.

2. The tendency of selective localization in certain organs was found to depend among other

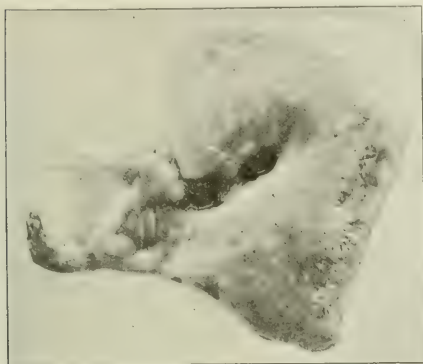


FIG. 2. Multiple ulcers of pylorus. The base of the one bordering on the duodenum is covered with digested blood. The other ulcer is clean. Both have the punched-out appearance.

things upon the virulence of the organism and could be modified by cultivation in functioning tissue. For instance, a culture of the organism isolated from a joint was apt to form on intravenous injection a septicopyaemia with abscesses predominating in the skeletal and myo-

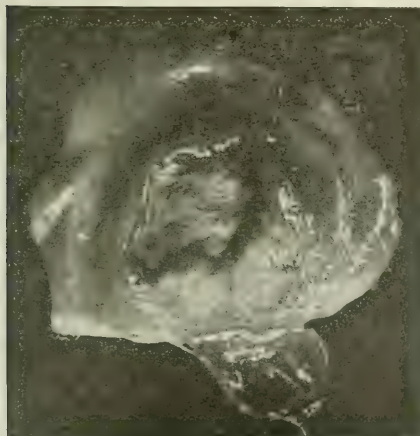


FIG. 3.—Large ulcer of pylorus, showing the undermined edges and muscular floor.

cardial muscles; that from the appendix showed an affinity for the intestinal tract, so that at times the appendix was the only organ revealing any gross lesion.

In the light of the above results, it seems possible that the staphylococcus is responsible for certain cases of gastric ulcer in human beings.

If by some means (through an erosion or trauma, etc.), a hyperacid gastric juice enters the tissues of a limited area of the stomach wall and the staphylococcus of proper virulence (for example from the appendix) finds lodgment there, it does seem quite probable that the necessary conditions used in producing the experimental ulcer would be duplicated. This point is still under study.

I wish to thank Drs. Paul G. Woolley and William B. Wherry for their valuable assistance in connection with this work. To Mr. Oscar Haude, I am indebted for the photographs.

THE FALLACIES OF GROUP TREATMENT.

By HERBERT J. CROMIN, M.D., CAMBRIDGE, MASS.

THE medical profession is today in a state of the highest organization. We refute the arguments made by Dr. Richard C. Cabot in a recent number of a popular magazine¹, that medical practice is in a badly organized condition because accurate diagnosis requires the services of a group of specialists who are not available to the majority without excessive expense. His solution is for a group of individuals to pay a fixed yearly fee to a group of specialists and then receive without further expense, group diagnosis and treatment. The idea is based on the plan of the University of California clinic, for which the students pay five dollars a year and receive complete medical attention.

EVERY GENERAL PRACTITIONER THE CENTER OF A MEDICAL GROUP.

Every general practitioner groups about him a corps of specialists, on whom he constantly calls when in need. In this group there is usually an eye, ear, nose, and throat specialist, a general surgeon, an internist, an x-ray man, and a dentist. Although there may be no definite contract between the members and the general practitioner, there is a gentleman's agreement that each will give his best advice and treatment. The financial condition of the patient, with the advice of the general practitioner, will decide the question of fees. Only the most able men in their particular line are picked to be members of a group, while a man's results will determine his continuance in it. As the general practitioner's business grows, he will add, perhaps, a gynecologist, a pediatrician, or a neurologist. He will make terms with a private hospital so that patients unable to pay the full rates may be admitted at reduced terms. The general practitioner lays no claim to being an all-around specialist,—but he

¹ American Magazine, April, 1916. "Better Doctoring for Less Money," by Dr. Richard C. Cabot.

is able to give the best advice and treatment in all the specialties through this system. His group is always ready and anxious to help him; he can choose his consultant when the patient's condition demands; and as a result of his organization, his patient reaps the benefit of the *best treatment at the least expense.*

ALL NECESSARY SCIENTIFIC TESTS PROVIDED FREE BY THE STATE OF MASSACHUSETTS.

The State of Massachusetts provides free every test that is of great importance to the public health that requires special knowledge or apparatus. It is true, as the doctor writes:

"He (the general practitioner) cannot pack into his grip an up-to-date x-ray machine, a selection of guinea-pigs, rabbits, sheep, or other animals which may be necessary for the performance of modern laboratory tests."

Yet the general practitioner is in no way hindered in his practice because he is unable to carry out himself all the possible scientific tests. Most of the ordinary common tests, such as examination of the urine, stomach contents, and blood smears, he can do in his own private laboratory. The more complicated ones that the state does are the Wassermann test for syphilis; the examination of the blood for typhoid or malaria; the sputum for tuberculosis; throat cultures for diphtheria; and the smears for ophthalmia. In addition, the antitoxins for diphtheria and tetanus, as well as the anti-rabietic and anti-typhoid serum are given free to the general practitioner. There is also a certain number of highly complicated tests used in some hospitals, but often their results are rendered useless because of the number of exceptions to their application. Some of the cleverest surgeons I have seen have been guided more by their deep knowledge of medicine and their broad clinical experience, rather than by the results of questionable tests.

Modern medical science has developed a type of man, common among hospital internes, that is unable to make a diagnosis, even in a simple case, without the aid of many scientific tests. The value of these tests is so over-estimated that well-defined, visible signs of disease are often not observed or are ignored. The most valuable assets of the skillful diagnostician are a few tests, coupled with the power of acute perception and accurate observation of the clinical aspects of the patient.

THE UNIVERSITY OF CALIFORNIA CLINIC.

The University of California maintains a hospital and corps of doctors by assessing the 7000 students five dollars a year each. It was from this clinic that Dr. Cabot got his idea of group treatment, and since has suggested that it be applied to the community as a whole. Yet these students are picked young people between the ages of eighteen and twenty-five, descended from the best stock in California and living in

the healthiest parts of their lives. Unless they had been physically fit, they probably would have been unable to enter college, and surely would not remain there if in poor health.

It is remarkable to me that there is need of a dispensary at all when I consider the claims of the breezy Californians, extolling their unequalled climate, with its health-producing qualities. Dr. Cabot saw "the students pouring into the clinic, many of them apparently in splendid health." What kind of young people are they? Can they be a group of neurasthenics, or were they trying to get their money's worth because they could "visit the doctor for nothing"?

This particular plan that is successful at this college, and which might be applied to manufacturing plants or industrial groups, is most grotesque when we think of using it with the general public. As sickness is most common in childhood and old age, it would mean that, with the exception of the young and healthy, a large part of the community would be in a hospital most of the time!

THE STILLMAN INFIRMARY AT HARVARD.

Harvard University has an ideal system, that takes the best possible care of its students. On entrance to college, every freshman is given a complete physical examination. A physician is at the college daily who can be consulted on all matters relating to health. The Stillman Infirmary is the university hospital, and for its use for two weeks each year, the students are assessed four dollars yearly. They are not restricted while there to any particular doctor, but may, at their own expense, choose whatever physician they wish. If in straightened circumstances, they will be treated free by the physician-in-chief, who is a general practitioner; and if special treatment is needed, there is a corps of specialists associated with him that will give their services free.

This system used at the Stillman Infirmary is most excellent. The hospital expense is four dollars a year to all; the medical charges are arranged so that a man financially able to pay, can give a fee commensurate with the services rendered, while the needy student is given all treatment free. It is very much the same idea that most general practitioners use so successfully in their daily practice.

THE HOSPITAL DIAGNOSIS COMPARED WITH THAT OF THE PHYSICIAN WHO REFERRED THE CASE.

The average general practitioner can say that his practice is roughly made up of fifty per cent. of simple, readily treated cases. Twenty-five per cent. are moderately serious conditions, such as pneumonias, fractures, etc., but handled without further assistance; the other twenty-five per cent. are cases that require consultation with some members of his group, or are sent to a hospital for further treatment. When the gen-

eral practitioner compares his diagnosis with that of the hospital, he usually is proven to be right. A diagnosis is not made by magic,—careful study of the case with the application of common well-known tests, that every practitioner can use, is the only method.

While I was a house officer at the Boston City Hospital, I was interested to see how the diagnosis of the physician who referred the case checked up with the hospital diagnosis after we had used the tests we thought necessary; and I discovered that the practitioner had diagnosed the condition correctly in about eighty per cent. of the cases. This is a remarkable record, when it is remembered that perhaps the patient was seen only once, and then in a poor light, or merely a provisional diagnosis was made, as it was obviously a case for hospital treatment. Sometimes a post-mortem examination proved the hospital diagnosis to be wrong, even though the case had received long and careful study. The cases at the Boston City Hospital can be compared to those of the average practitioner because they are the rank and file of the ordinary medical cases. It takes under its care any citizen of Boston who is sick and applies for treatment, regardless of whether his condition might prove interesting from the medical standpoint. Hence the results obtained and those of the practitioner are somewhat similar.

THE MEDICAL TRAINING OF THE GENERAL PRACTITIONER.

The general practitioner today receives an excellent training at medical school in the rudiments of all the specialties. After graduating, most of the men take a hospital appointment of a year or so, and perhaps later, post-graduate courses. By visiting the various clinics and studying the medical journals, they keep abreast with the advances in modern medicine. Competition is so keen that they must do these things if they are going to get results with their cases. Yet Dr. Cabot writes that:

"Those who attend the best of our large public hospitals free or for trifling fees are really the aristocrats among patients. Those who call a physician to their houses or visit him at his office are the unfortunates, doomed to pay high for a relatively poor bit of service."

The general practitioner does not imagine that he is able to treat or operate on all troubles; yet he can recognize such conditions and refer the case to a man who is able to properly handle it. Let the practitioner make a careful, thorough physical examination, and if there is trouble present, he will be able to find it.

LODGE WORK AT CONTRACT PRICES.

Lodge work has been the commonest form of group work at contract prices here in the East. An organization will assess its members a dollar or so a year and engage a doctor to look after the health of the group by the year. The work

is nearly always unsatisfactory, both to the doctor and to the members, who have a peculiar mental obsession that because you are receiving only a fixed fee per year you will give them as little consideration as possible,—while to avoid treating them, you will tell them that they are well and able to work, when they may be in poor physical condition. Some think that you regard them as pests, and the really sensitive ones will engage a private doctor and pay him, rather than have the lodge doctor free.

When a man is sick, his mentality changes. During the long hours of sickness, the lodge member becomes suspicious of everything; he quickly decides to take no chances with a man not paid by himself, and not working for his interests alone. He usually engages his family doctor, and is then sure that he will not be neglected because he is merely a member of some group or lodge, and that his doctor's fee is limited to the pay of the lodge.

INCONSISTENCY OF STATEMENTS.

Like so many well-meaning reformers, Dr. Cabot has a tendency to be inconsistent in his statements. At the University of California, he saw "the students pouring into the clinic. They were coming because they needed advice about trifling ailments which, if treated in their trifling stage, might very possibly be prevented from becoming serious." That seems logical enough, but what a surprise to read further in his article: "Many patients have a decided proneness to acquire the 'doctor habit'; I mean the habit of running to a doctor frequently for all sorts of minor ills. Such a habit is often very bad for the patient." Yet to return to our students, "they were eager to go to him in a stage of the troubles which the doctor very seldom has the opportunity to see,—that precious early stage, which ordinarily has passed by before the patient is driven to face the expense and trouble of a doctor's visit."

In other words, it is all right for the students to visit the free clinic if they have minor ailments; but after they have graduated and wish to consult their family doctor for similar conditions and pay him a fee, they are running danger of contracting a habit that can almost be compared with the morphine habit!

Crime and disease walk hand in hand. Are there people who think that our honorable judges are conniving with criminals for the continuation of crime,—and that they are not laboring to stamp out all vice? It is surely to their interest that crime exists: without it, they would lose their livelihood. Can you then agree with Dr. Cabot in that, "It is not the practitioners' interest that people should keep well or should suppose themselves to be well in a short time?" What a calumny to heap upon the general practitioner, who has been always in the van-guard of every campaign launched for the prevention of disease!

HEALTH INSURANCE.

The greatest hardship for the average family at the time of sickness is not the doctor's bills, but the fact that the weekly wage has stopped. Not only the family suffer, but the tradespeople receive severe losses, since they are unable to collect their just debts. To get relief from this distressing condition, any one may join a group of individuals and have guaranteed during sickness a weekly income of from ten to fifty dollars a week by paying a small yearly sum into the common treasury. This relief is designated by the prosaic name of Accident and Health Insurance and the payments are called premiums. It is open to all, but few take advantage of it.

MEDICINE A PUBLIC CHARITY?

When all these problems are given quiet consideration, should a man so bitterly malign the entire profession merely to give higher color to his favorite ideas? How can he remain a professor at Harvard Medical School, which is yearly turning out scores of young men to become general practitioners, if he believes the substance of his own statements,—that such men are going to prey on the general public, and will be little better than ignorant charlatans! Should even the insane desire for publicity seduce any physician to trample into the mire the recognized standards of the profession,—truth and sincerity?

Sometimes one wonders if medicine is to become a public charity and its service to be classed like that of the almshouses. Why do so many that could pay, rush to a free hospital to be operated on for nothing, and even then begrudge the hospital its small fee? The same parties will spend their last dollar to win a law suit and not grumble about it.

Dr. Cabot advises the public to go to a public hospital, for it is only there that one can get accurate diagnosis, and that for nothing. Then, why not all patronize the bread line and the soup kitchen? The bread and soup are excellent, and will cost us nothing!

Medical Progress.
**TENTH REPORT OF PROGRESS IN
ORTHOPÆDIC SURGERY.***

By ROBERT B. OSGOOD, M.D., ROBERT SOUTER, M.D.,
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(Continued from page 658.)

ORTHOPÆDIC WAR SURGERY.
Tendon Suture.

Wagner⁷⁵ has seen a considerable number of cases of injuries to the extensor tendons of the

fingers which generally lead to a flexion contracture, making the patient unfit for work or duty. A simple secondary suture or plastic operation which can be done under local anesthetic as a rule leads to recovery within four weeks. The distance between the ends of the tendons has been in his cases 1/2 to 6 cms. Wagner illustrates a number of simple methods for secondary suture and plastic operation, generally not much different from the methods described in the text-books. In order to prevent adhesions of the newly formed tendon Wagner has placed them in calves' arteries, either conserved in Ringer solution or taken fresh from the animal and placed for half an hour in 3% Hyperol solution. Wagner has found, however, that it is not necessary to use such materials, but that the best results are obtained by having the newly formed tendon move at once. Most cases have no splints at all, and are advised to move the fingers actively and passively from the very day of the operation. Wagner does not think it advisable to suture ends of the tendons while the finger is hyperextended, because the tension is too great, which may invite secondary rupture. Furthermore, movement of the fingers is limited and adhesions are thus favored.

Infected Wounds of Joints.

Burekhardt and Landois⁷⁶ advise a resection in infected joints in which there has been a moderate destruction of bone, and when the patient is in good general condition and can remain in the same hospital for after-care. They believe that this method affords a better chance for future function and often avoids amputation. They regard the chances of success to be expected from the operation to be best in the hand, next in the foot, the elbow, the knee, the shoulder, and last of all in the hip. In infected shoulder and hip joints they regard the prognosis even with resection as dubious. In these joints resection should be the last resource and primary simple drainage with fixation the routine.

Doberauer⁷⁷ has observed an interesting case of an infected elbow joint, in which the bullet made a hole in the olecranon process. The drainage was perfect and the functional result excellent. Since this case Doberauer has systematically trephined the olecranon in all cases requiring drainage of the elbow. He considers the advantages to be drainage by gravity, at the same time leaving the muscles, ligaments, and nerves uninjured.

Haberer⁷⁸ is impressed by the fact that most wounds of joints do not become infected. It is dangerous to drain a joint wound from the beginning. Fixation and leaving the joints alone are the best initial treatments, except in gas phlegmons, where immediate action is necessary. The operative treatment is not required unless fever, pain, and swelling keep up, then the joint should be punctured. Where pus or purulent effusion is found a small incision is made and a rubber drain introduced, the cavity being washed out with a 1-4% solution of formaldehyde

* This report is based on a review of 110 articles selected from about 900 titles having to do with orthopedic surgery, appearing between Nov. 1, 1914, and Jan. 1, 1916. References are given to such articles only as have been selected for note and comment.

if the secretions are thick. The functional outcome is much better with multiple small incisions than with an extensive opening. In only one out of fifty cases of severe suppurating injuries of large joints has amputation become necessary. When there is general sepsis amputation is of no avail. In several such cases the autopsies showed that the joint lesion was healing well. Treatments should be directed against the septicemia. The patient should not be further weakened by a futile amputation.

Coenen⁷⁹ has treated a case of gunshot wound of the sacro-iliac joint in which the Trendelenberg sign was present. This led to the diagnosis of joint injury, and the x-ray showed the bullet in the sacro iliac joint. The patient on entrance could scarcely walk, complained of pain radiating into the right leg, the lumbar spine was rigid, and, as has been said, the pelvis sank on the side of the wound when he stood on the affected limb. The removal of the bullet resulted in the restoration of a normal gait.

Blind⁸⁰ makes a very timely plea for a coöperation between general and orthopaedic surgery in all cases of bone and joint and muscle injury received in the war. He cites cases in which long immobilization in positions unfavorable for future function had resulted in an incapacity from which the patients could never fully recover.

(Ed. Note.—The importance of this coöperation cannot be too strongly emphasized. It has its advantages in the surgery of peace as well as of war, but no orthopaedic surgeon who has had an opportunity to observe the methods of treatment and the joint positions maintained during convalescence in even the best base hospitals can fail to realize the surprising lack of preventive surgery which obtains. The help which orthopaedic surgery can offer in the way of preserving function and conserving efficiency is a very real help and a help much needed.)

APPARATUS FOR THE LESIONS OF THE WAR.

The medical literature of the present time is very rich in description of all kinds of apparatus which have been devised to diminish suffering and promote restoration of disturbed function which have been caused by wounds of the war. There is more or less merit in all with which we are familiar, but certain types of apparatus seem to stand out as appealing to many general surgeons and orthopaedic surgeons, and of these we shall speak.

Splints.

In English, Major Robert Jones⁸¹ little book on "Injuries to Joints" is most suggestive and helpful. Simple, ingenious, very practical splints are described and illustrated and the rationale of their uses explained in his characteristically clear and concise manner. There is little said concerning the uses of plaster of Paris and we suspect a prejudice born of some unfamiliarity with its varied uses. Splints seem

to take first rank in the English treatment of compound fractures.

There has been published also a small book in German by Spitzzy and Hartwich⁸² which describes clearly the methods which they have followed in fresh injuries and deals most instructively with the care of convalescents and with the various cheap and efficient forms of protheses following amputations.

Plaster of Paris.

It is interesting to see how strong a hold plaster of Paris dressings have, especially in the hands of orthopaedic men. The articles of Fayerweather,⁸³ Stoeger,⁸⁴ Lange,⁸⁵ Goebel,⁸⁶ Maunson,⁸⁷ Hackenbruch,⁸⁸ Grasser,⁸⁹ Greenough, Osgood, and Vincent,⁹⁰ all indicate that the varied adaptations of plaster of Paris in the treatment of compound fractures are of great importance, and in the opinion of many other surgeons represent the methods of choice, sometimes combined with traction, sometimes alone. The comfort of the patient is certainly great with a properly applied plaster. Wide windows spanned by reinforced bridges of plaster give ample space for moist dressings and constant irrigation, and with a modicum of care arrangement can be made for the application of a tourniquet in case of a threatened secondary hemorrhage.

Overhead Supports.

We find also general satisfaction with the so-called Balkan method of treating compound fractures. The essential principle involved is an overhead frame, fastened to the bed, by which lifting and extending traction may be applied. This form of treatment has been employed at the American Ambulance in Paris, in the service of Dr. Joseph Blake, and by Jentzer⁹¹ in Serbia and Switzerland.

Orth⁹² has been impressed with its value in Germany, especially in fracture of the femur. The English base hospitals are well supplied with these frames.

Special Apparatus.

Especially in upper limb fractures and contractions of joints and muscles, German surgeons are finding the so-called ladder splint of Cramer of great adaptability. This splint, as the illustration shows, (Fig. 1) consists of a pair of parallel wires connected with finer wire cross bars, the whole bendable, but stiff enough to afford real splinting. These splints are used in connection with plaster of Paris or alone, and have proven most useful in the hands of Backhammer and Horn,⁹³ Heymann,⁹⁴ Borchers,⁹⁵ and Walter.⁹⁶

An apparently useful apparatus for application of traction in the position of flexion in fractures of the thigh has been devised by Roschke,⁹⁷ (Fig. 2.) He, as well as Grundler,⁹⁸ Angerer,⁹⁹ Wildt,¹⁰⁰ and others, believe that traction and counter-traction are best maintained in fractures of the thigh by this position of flexion.

Welty's¹⁰¹ apparatus for foot drop seems

very practical and easy to apply and adjust. The editors have had no experience with it, but

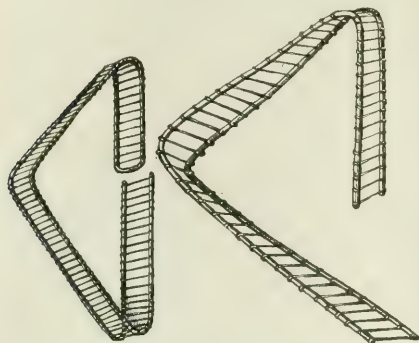


FIG. 1.—Cramer's ladder splint.

illustrate it since it appears to be so simple, (Fig. 3.)

Our space is too limited to describe other forms of apparatus, such as the woven wicker splints of Kessler,¹⁰² and the telescopic splints of König,¹⁰³ but it is quite evident from a review of the literature of the war that orthopædic surgery is playing a most important part and is des-

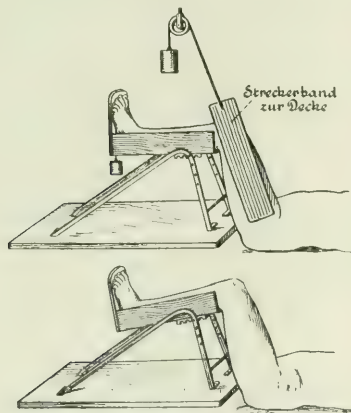


FIG. 2.—Reschke's apparatus for application of traction in a flexed position in fractures of the thigh.

tinued to continue to do so after the fighting is over and the reconstruction period begins.

MECHANOTHERAPY.

This method of treatment is being more and more generally employed in France and Germany and possibly in the other warring countries as well, though the editors lack information in this regard. More and more surgeons are realizing the importance of the crippling sequelæ of wounds and turning to mechano-

therapy as the most sane and speedy method of relieving contractures and stimulating return of function. Thus "universal orthopædic apparatus" has been devised by Wunsch,¹⁰⁴ working on the principle of lever and pendulum, applicable even to the chest expansion. Several French "universal" machines have been invented, which are most valuable and ingenious, and are being used constantly at Berek-sur-Mer under the skillful supervision of Calvé, and in several



FIG. 3.—Welty's apparatus for the correction of foot drop.

places in Paris, including the American Ambulance. These machines will hardly replace the more specialized and varied types of Zander, but they have placed within reach of many more patients this important method of therapy.

THE PREVENTION OF CRIPPLING AND THE OCCUPATIONAL TRAINING OF CRIPPLES.

Laquerrière and Peyre¹⁰⁵ draw their conclusions from a service of 1200 beds in central physiotherapeutic and convalescent hospitals. They state first that fifteen to twenty per cent. of the less severe sequelæ could have been avoided if it had been known how to apply proper therapeutic measures at the beginning. They insist that absolute immediate fixation of all wounded members is a prime requisite. They deplore too long continued fixation. They urge more careful prevention of possible future complications, such as contractures and malpositions. Three things are necessary to prevent the disabilities following the closing of a wound or the mending of a fracture: (1) Absolute immediate immobilization maintained till the base hospital is reached and then complete immobilization, only exceptionally; (2) rapid establishment of passive motion and massage; (3) the direction of this passive motion to the cause of the functional disabilities. Few instruments or special apparatus are necessary. Too great delay should not occur in operating on nerve traumata. Often neuropathies are mistaken for true nerve lesions. We could well add a fourth requisite in the prevention of disability, namely, when fixation is employed, it should be

maintained in position favoring future function.

In analogy to the Ten Commandments, Ritschl¹⁰⁶ reminds the military surgeon of certain important orthopaedic facts which are known to the orthopaedic surgeon, but often enough not sufficiently valued and recognized by all who have to do with injuries and other infections of joints. He emphasizes the importance of correct position, of avoiding too long fixation. He advises that special attention be paid to important extensors, such as the deltoid and the quadriceps. He refers to the importance of massage, hot air, etc., as effective means for the absorption of hematoma. His advice would seem to be not untimely at the present moment.

Vulpius¹⁰⁷ agrees with these rules, but opposes very strongly the one in which the sling is recommended for injuries of the shoulder. He calls attention to the severe impairment of the function of the arm when the shoulder is allowed to stiffen in an adducted position, and advocates quite wisely the position of abduction by some form of splint in order to avoid these very dangerous adduction contractures.

Training School for Maimed Soldiers.

Mosny¹⁰⁸ discusses what has been done in other lands for persons crippled by industrial and other accidents, and then describes the workings of the training school for crippled soldiers that has been in operation at Lyons since last December. The men live in the school during their course of training, and the institution in various ways is a model. Another training school to teach horticulture is being organized. These, Mosny states, are the only practical realizations in France to date of aid by professional re-education and re-adaptation to remunerative work for those mutilated or crippled in the war. At Lyons the men are taught to use the stump of the arm without regard to an artificial limb. The prothesis is to be selected later when the man has learned exactly what is best adapted to serve him in his work. Mosny discusses the general principles and special details of training the maimed to utilize the earning forces they have left and of finding employment for them. It is a task the country must assume, he adds, and it will require her ingenuity, all her material and moral forces, and all her goodness of heart. His plan contemplates loans to those who wish to set up a business for themselves.

One of the most suggestive attempts to meet the increasingly complex problems of the war cripples is under successful trial in Chailley in England. Here a well established industrial school for crippled children has opened its doors to the crippled soldiers, and while giving them a home, employs its original inmates, who have learned trades, to instruct in their turn their country's maimed patriots.

(Ed. Note.—Germany was prepared perhaps more than any other country to care for its cripples, but this burden is already a fearfully

heavy one. It should stimulate our own endeavor in America to make proper provision for at least the cripples of peace. No phase of preparedness is of more sociologic or economic importance. With our present wholly inadequate provision for the occupational training of the cripples who are already among us, there can be no difference of opinion as to our proper course of action in this regard among the champions of either preparedness or pacifism.)

MISCELLANEOUS.

"Swollen Feet."

Jansen¹⁰⁹ has made an exhaustive study of the so-called swelling of the feet, an affection very frequently seen in marching soldiers. By a series of x-ray pictures Jansen proves that no fracture generally underlies this affection, but explains it by a spastic cramp of the interosseous muscles caused by over exertion. He thinks that these muscles by their cramp obstruct the circulation not only in the soft tissues but also in the firmer parts of the middle foot and lead by increased tension of the fluids within the tissues to edematous infiltration. While the swelling of the soft tissues is very extensive and capable of quick regeneration, that of the bony parts is only slight, but of prominent importance. The periosteum is responsible for the proliferation of bone as seen in x-rays. A very strong pull of the muscles on the edematous periosteum may easily lead to hematoma and irregular thickening. The substance of the bone itself does not swell, but its firmness diminishes, thus leading eventually to spontaneous fracture. This cramp of the muscles of the middle foot is analogous to that of the whole foot in the acute strain. Jansen, therefore, calls this affection "pes valgus contractus partialis," or the "contracted anterior foot," or "anteper contractus."

Juxta-articular Sarcoma.

Roberts¹¹⁰ finds that many of the cases of this disease in the vertebrae, hip, and knee are treated as tuberculous, and that they show symptoms of spinal cord disease rather than the pressure effects in weight bearing. Roberts thinks the x-ray is most important, says that the pain, local tenderness, and deformity often determine the diagnosis. Treatment by fixation does not relieve the symptoms. Roberts' article gives information in the way of differentiating this rather rare condition from the more common diseases of the bones.

Multiple Cartilaginous Exostosis.

After citing a case that he observed, Ehrenfried¹¹¹ draws a few conclusions in regard to this disease, which he considers as distinctly hereditary; if not hereditary, at least the author believes that it is congenital, and prefers to consider these cases as a type of deforming chondrodysplasia. The disease is characterized by the occurrence of multiple more or less symmetrical cartilage and osteocartilaginous growths, which are generally benign, and result from a

disturbance in the proliferation of the bone-forming cartilage. Certain typical secondary deformities of the skeleton occur. The hyperostoses as a rule affect the ends of the diaphysis close to the epiphyseal line. Ehrenfried recognizes that true exostoses occur in other regions. In fact, he tries to find in all these cases of multiple cartilaginous exostoses a distinct relation to the chondrodystrophic type of dwarf, with its short limbs and long body, though he classes the disease with rickets, acromegaly, and osteogenesis imperfecta, which are distinctly conditions of faulty bone and glandular metabolism. He believes the lesions are due to a faulty "anlage" for the bone producing intermediary cartilage.

Anteversion of the Femoral Neck in the Normal Femur.

Durham¹¹² has made a study of the anteversion of the neck of the femur in the normal individual and of its variations, which must be of importance when we consider cases of congenital dislocation of the hip. In studying 200 apparently normal, anatomic specimens, the femur was laid on a flat surface, with both condyles and one of the trochanters touching, while the angle of the axis of the femoral neck with the table was carefully measured. The average anteversion was 12°. Forty per cent. of the cases showed between 2° to 10° of anteversion; another 40% from 10° to 20° anteversion. The extreme anteversion was 35°, but in only two cases was it anywhere near this, and probably any condition beyond the limits of 5° to 20° of anteversion may be considered out of the normal.

Intermittent Claudication.

Bianchi¹¹³ describes in detail a case of intermittent claudication or angina cruris, in which the condition seemed due not to any change in the peripheral blood vessels nor in the blood vessels of the spinal cord or medulla, but rather to a change in the circulation in the brain. There were repeated attacks induced by muscular exertion of some sort. These attacks were finally much improved by treatment directed toward improving the general circulation.

The Mechanics of Nerves.

By clinical experience and by experiments on monkeys, Stoffel¹¹⁴ has found out that the appearance, course, and tension of the internal and external popliteal nerves are quite different, when the knee joint is in flexion and in extension. In the flexed position the nerve appears relaxed, wavy, and shows transverse and oblique wide stripes. If the nerve is cut there will be no gap at all, or only a small gap, if the joint is flexed, but a large one if it is extended. For the treatment of nerve injuries, Stoffel has worked out the most appropriate position for all of the large joints, as follows: For the brachial plexus and for the large nerve trunks in the axilla, adduction of the humerus; for the median and ulnar nerves along the humerus, acute flexion of the elbow and adduction of the

upper arm; for the ulnar nerve where it passes the elbow, extension of that joint and adduction of the humerus; for the median at the forearm, right angle flexion of the elbow, supination and flexion of the wrist; for the ulnar, extension of the elbow, supination and flexion of the wrist. For the radial right angle flexion of the elbow, supination and maximum dorsal flexion of the wrist. For the sciatic nerve extension of the thigh, and if the injury is on the back of the thigh, flexion of the knee joint and plantar flexion of the foot. For the femoral nerve flexion of the thigh. After three to four weeks the nerves are so firmly united that the extremity can then be brought into a more natural position, thus preventing contractures.

The Intervertebral Foramen.

In a small volume of 100 pages Harold Sanberg¹¹⁵ makes a unique study of this foramen in man, using the smaller serial sections from the cat to better demonstrate the anatomy. A study of his work will help to determine whether compression of the nerve is likely to occur at this point. The spinal nerves as they pass out through the intervertebral foramina are almost completely surrounded by fat cells. Outside of the foramen the nerves come more closely in contact with the fibrous tissues; as the nerves divide into anterior and posterior divisions they become more completely surrounded by fibrous tissue. This tissue is also attached to the two adjacent transverse processes. The nerves pass immediately inferior to the transverse process of the upper vertebra and are very close to it. It is remarkable how little fat tissue there is about the nerve after it leaves the spinal canal. External to the intervertebral foramina little fat is to be seen around the nerves, and the increase of fibrous tissue in the microscopical sections is very noticeable. In cross section the spinal nerve appears to be less than one-third the size of the foramen. Atrophy of the intervertebral discs would reduce the size of the foramen, but not enough to cause pressure on the nerve. In thinning of the cartilages on the articular processes, the foramen is actually increased, by a lengthening of the antero-posterior diameter. "Possibly, in some cases of ankylosis, the nerve may be subjected to bony pressure, but this is very rare." Both in the spinal canal and the bony intervertebral foramina the nerve is well protected by a thick surrounding layer of fatty tissue. The author thinks it rare and only in extreme bony overgrowths that pressure on the nerve occurs there.

Biesalski,¹¹⁶ who has taken over the editorship of the *Zeitschrift für orthopädische Chirurgie*, announces in the introduction the methods by which he proposes to conduct this important orthopaedic journal. He plans to devote some space to the history and development of orthopaedic surgery, because he believes that a great many methods, which are constantly invented only to be forgotten very soon, would be worked out more thoroughly before publication if the au-

thors had had knowledge of work which had already been done along these lines. The history of orthopaedic surgery will be covered by monographs on certain subjects and by biographical sketches of important orthopaedic surgeons. It is planned further to extend the exchanges of orthopaedic papers with other countries. Biesalski emphasizes the prime importance of physiological and anatomical as well as clinical and experimental research. Finally social questions, the necessity of orthopaedic teaching, progress in the care of cripples, and other significant problems are to be considered. Besides the already very highly developed abstract department, collective reviews are planned. Furthermore, it is announced that a new edition of Hoffa's text-book of orthopaedic surgery is to be prepared by Goett and Blenke, who also intend to renew the "Hoffa-Blenke" catalogue of orthopaedic literature.

An evidence of the progress of orthopaedic surgery is the new form of publication begun in January, 1916, by the *American Journal of Orthopaedic Surgery*. A monthly journal has replaced a quarterly, and its scope is expected to be widened by original contributions bearing on orthopaedic surgery from well-known general surgeons and by an increase in the number of abstracts and their more timely publication. It remains to be seen whether the American medical public is ready to help support such an endeavor, which is financed largely by the American Orthopaedic Association.

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Reports of Societies.

THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

MEETING OF WEDNESDAY, OCTOBER 6, 1915, AT 8 P.M.

The President, DR. JAMES C. WILSON, in the Chair.

SOME APPLICATIONS OF PHYSICAL CHEMISTRY TO PROBLEMS IN MEDICINE.

DR. HENRY LEFFMANN: Under the term, physical chemistry, a vast and intricate science of molecular conditions and transformations has grown up, and has begun to throw light in many directions upon the problems presented by both living and non-living matter. It is my purpose in this paper to set forth in a plain manner a few of the data of physical chemistry that bear directly upon practical medicine. The science is abstruse and the facts can be treated only in an elementary way. I select for the purposes of the paper two phenomena, "ionization" and the "colloidal state." The phenomena of ionization are concerned especially with the condition ordinarily called solution, the latter term being here limited to fluids produced by association of substances, one of which is primarily a liquid. The term solution has a much wider significance in physical chemistry, common glass being considered a solution, but I will not apply this broad meaning in this paper.

Until a few decades ago the liquids obtained in dissolving common sugar and common salt in water were designated "solutions." It is now known that the activity of the salt has been materially increased, while the sugar has suffered no such change. The sodium atoms of the salt have by the act of solution acquired a positive electrical charge, while the chlorine atoms have acquired a negative charge. The proportion of salt thus modified is dependent largely upon the mass of water present. The modification of a substance by which it acquires these electrical charges is termed ionization; the respectively positively and negatively charged elements are termed "ions." The importance of the change lies in the fact that the chemical activity of the substance and the pressure of the solution are much enhanced by it. It is found that the most potent ionizing liquid is water. Generally the degree of ionization is increased by dilution. Interesting explanation of well-known phenomena are now possible under these principles. Boric acid is of the same type as nitric acid, yet is far less active. The difference is due to the fact that boric acid is but feebly ionized, while nitric acid is largely ionized. This applies also in the dilution of concentrated acetic and sulphuric acids.

The application of the data of ionization to the interpretation of the action of medicines is complicated by the fact that living protoplasm and membranes have specific selective powers, and thus tests *in vitro* may mislead. For example: Under given conditions, mercuric nitrate ionizes to a much greater extent than mercuric chloride, yet the latter is ordinarily more toxic. According to Höber this is due to the fact that the chloride is more soluble in the lipid substances contained in the membranes, and thus is enabled to get into contact with the protoplasm of the cells. Another important point is the influence of salts upon one another.

It is far from being generally true that when a mixture of two or more substances shows no appreciable change of condition, such mixtures will have the properties of all the ingredients. An instance is that a mixture of mercuric chloride and hydrocyanic acid is not equivalent to mercuric cyanide, because the substances react in a different manner to the dissolving fluid. Inasmuch, however, as other solvents than water act but feebly in ionizing, it is not unlikely that an alcoholic solution of mercuric chloride and hydrocyanic acid would have a closer equivalency to mercuric cyanide than a solution in water. The cyanides afford several striking instances of the anomalous effects of mixtures. These data would seem to point to the importance of simplification in prescriptions. The files of any drug store will show most extraordinary mixtures, violating the simple principles of pharmaceutical chemistry. Might not the method of the homeopathic school of administering several potent substances at intervals be commended to the regular school of chemistry? The phenomena of reaction of salts to the solvent and to each other when associated in solution have important applications to the so-called "mineral waters," and no class of waters shows more untrustworthiness in these respects than the so-called "lithia waters." Another point brought into prominence by the progress of physical chemistry is the influence of extremely fine division. Ultra-microscopy has been developed of late years, dealing with the methods of rendering visible particles quite undetectable by ordinary microscopes. It follows from a consideration of this phase that by dividing a material finely we greatly increase the facility of chemical action. We also confer among other qualities constant self-agitation and easier passage through porous partitions. Medicines that are insoluble or difficultly soluble in the fluids of the body should be administered in as fine powder as possible, and here again we have to give reason to the homeopathic school. Manufacturing chemists do not always apply the highest principles of physical chemistry in their processes, and hence we sometimes find in drug stores preparations of distinctly inferior quality.

The physical chemistry of colloids is now occupying a vast army of workers. The initiative in this field is due largely to an English chemist, Thomas Graham, who in 1861 published the results of experiments on diffusion through membranes, finding that when a mixture was made of two substances, one of which was crystallizable and the other not, the former would pass rapidly through the membrane, while the other would be held back. He divided substances into two classes, "crystalloids" and "colloids." A solution of gelatin and common salt in water exemplifies both types. It is now known that a classification of substances into crystalloid and colloid is not fundamental. These are conditions only, and the same substance may assume both states. The crystalline condition probably results when molecular attractions are allowed more opportunity of acting; the colloidal condition results when less opportunity is afforded. Hence we find that crystals are produced by the solidification of a substance from a liquid or gaseous state. Also, the presence of a minute amount of a crystal of the substance in solution will materially promote the separation in crystalline form, acting as a nucleus for the operation of the molecular forces. Whatever may be the effect of uric acid when in the blood or deposited in the tissues, it is a serious interference

when separated in the crystalline form from the urine. Experiments made under the supervision of Dr. Martha Tracy at the Woman's Medical College of Pennsylvania indicate that a full meat diet increases the acidity of the urine. If this is established it will be an important point, for the principal danger from uric acid is in its separation in the crystalline form in some part of the genito-urinary tract. Such separation is promoted by increased acidity, and if a minute crystal is deposited at any point it will act as a nucleus, bringing about further separation of uric acid and of other compounds held in unstable solution in the urine. The administration of alkalis for the prevention of this separation may lead to the precipitation of substances not soluble in alkaline urine. It is obvious, therefore, how a full meat diet may cause or aggravate uric acid troubles, although not increasing the output of the acid itself. Knowledge of the nature and properties of colloids enables us to explain many physiological and pathological phenomena. Intimately connected with this field of chemistry is the subject of enzymes. These probably form the connecting link of living with non-living matter. They show colloidal properties and possess high powers of absorption. The problem of the cell is largely a problem of physical chemistry. Physical chemistry may be characterized by the description of politics which Mr. Pickwick gave to Count Smol-tork: "A difficult study of no inconsiderable magnitude."

DISCUSSION.

DR. S. SOLIS COHEN: Dr. Leffmann's paper deals with a subject of such magnitude that a certain degree of temerity is required on the part of him who would approach it, not being a professional chemist. In so far as the physico-chemical reactions in the living body are the same as those of the laboratory, we may apply the laboratory findings to the problems of biology,—to physiology, to pathology, and to therapeutics. But as regards the great and increasing number of the outstanding biologic problems of the day, the value of the unknown factor, the x , or the x y z , is so great that we must hesitate. I think no stronger illustration of that can be given than the researches of Fischer upon edema and nephritis, and yet I do not know any clinician or pathologist who is willing to accept, without considerable reserve, Fischer's far-reaching conclusions. Fischer advocates the treatment of albuminuria, and of edema resulting from nephritis, by the introduction into the blood, of a concentrated (i.e. a *hyperhemotonic*) alkaline saline solution; and suggests one containing from 10 to 20 grams of crystallized sodium carbonate, and 10 to 30 grams of sodium chloride to the liter of water. This is from two to six times the concentration of the ordinary, so-called physiologic saline solutions. Fischer also rejects osmosis as an adequate explanation of cytolytic and similar phenomena, and opposes as unscientific, the common practice of restricting the intake of sodium chloride in conditions of edema associated with nephritis. Many striking instances of success by following his methods have been reported, also many failures. No analysis yet made has given data whereby the conditions determining the success or failure can be exactly estimated. Referring briefly to the phenomenon of ionization described in the paper, Wolfgang Pauli, in an interesting series of studies of the effects of various ions upon the living

cell, investigated their comparative precipitating powers upon proteids and deduced the laws that: (1) The effect of a salt upon a protein is made up in the main of the algebraic sum of the effects of the individual ions; (2) that anions and kations antagonize each other. Pauli found that sodium sulphocyanide tended to reduce blood pressure and to prevent deposition of calcium in the arterial walls, so that it could be used with good clinical results in cases of arteriosclerosis. He found also that sulphocyanides were even more active than iodides in favoring the formation of readily soluble protein compounds with the heavy metals, and thus favoring elimination in cases of chronic poisoning. Other considerations enter into this problem, as into that of decalcification, but the whole subject comes under the head of ion-colloid reactions important to pathologist and therapist. In connection with the subject of sulphocyanide ions, however, the warning should be given that whereas sulphocyanide may be safely administered in doses up to 1 gram daily for sedative and analgesic as well as pressure-lowering effect, yet any compound of the sulphocyanide ion with an ester will produce almost instant death, owing to the solubility of the cell-lipids in esters. Dr. Leffmann referred to the theory of narcosis by lipid solvent substances, and this is a further illustration. In applying such studies as those of Dr. Fischer, it is important to bear in mind the modern definitions of acidity, alkalinity and neutrality. So in Pauli's experiments it seems strange to read that nitrate and acetate are ions inhibitive of precipitation, when we daily use nitric acid and acetic acid to precipitate albumin out of urine. But in acetic and nitric acids, we have, according to the modern view, hydrogen acetate, and hydrogen nitrate. Hydrogen is the kation, and if arranged in Pauli's series, should be placed as the strongest of all precipitants when ionized. Thus, too, we find acetic acid a more delicate test for albumin than nitric acid, because the acetate ion has less inhibiting power than the nitrate ion. So, at least, it seems to me. I should like to have Dr. Leffmann's view.

DR. ALFRED STENGEL: There is great reason that practical physicians should know something about the principles of physical chemistry and the newer principles of physics. The use of saline solutions is a method too often employed with the barest knowledge of the principles involved. The use of solutions of greater concentration than the solutions of the body will not bring about the desired results. The introduction of hypertonic solutions into the blood stream, as advised by some French clinicians, while carried out apparently without damage, is a questionable procedure. An argument in favor of physicians knowing something of the newer science is the principle of absorption in the combat against certain bacteria. This is demonstrated in the work of bacteriologists with Fuller's earth in the treatment of local infections, in which it has proven of unquestionable value in the matter of diphtheria and typhoid carriers. By the administration of Fuller's earth the bacteria have been removed in a way that chemical antiseptics are incapable of doing. Speculation arises in my mind whether or not the use of some of these insoluble substances may not act in the intestinal tract in this way. The work of Ehrlich comes closely upon the topic of physical chemistry. Investigators the world over are busying themselves with substances which in themselves harmless, in physico-chemical

combinations with tissues of the body or with bacteria rendered these elements innocuous.

DR. THOMAS McCRAE: One danger to which many of us are exposed, not only in respect to the application of physical chemistry, but in other problems, is that of picking up terms without learning their meaning. This subject of physical chemistry lends itself to that. It is easy to talk about ions and ionization without having a clear idea of what is meant; of colloids and crystalloids, without having any clear conception of their meaning. In the paper everything discussed is made absolutely clear. Ionization has a tremendous bearing upon the bodily activities. Perhaps we are all familiar with the fact that ionization and electrolysis are closely connected. "Electrolysis puts life into the proteins." Dr. Stengel has referred to the use of hypertonic solutions. An interesting work is that done by Rogers in the giving of hypertonic solutions in the treatment of Asiatic cholera, in which his results justify the treatment.

DR. JOSEPH SAILER: The subject illustrates, first of all, the sympathetic quality of the medical profession in that it must take toll of all the sciences for the understanding of disease and the welfare of the human race. I agree with Dr. McCrae that we are prone to use terms with which we are not fundamentally familiar and apply them to therapeutics, believing that we are using physical chemistry when in reality we are working with something concerning which we know very little. Among many physical chemists, too, there is a great difference of view. Experiments of definite findings must not be too freely applied to living tissues since the physical chemistry of living tissue is not yet a very clear factor. The fundamental element in physics, in chemistry, and possibly the universe, is the atom, and it would seem that until we have a clear idea of the structure of the atom we could not go ahead in the solution of these problems. Until we have a clear conception of some of the problems of physics we are not at liberty to apply our methods with the idea that we are using a tremendous scientific advance in medicine. The application of definite facts of physical chemistry, however, is important, and, as in the use of the x-ray and all forms of radioactivity, must be carried out empirically before its value can be determined.

Harvard Medical School.

MEETING OF THE MEDICAL SOCIETY.

IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, APRIL 25, 1916.

Chairman, DR. HENRY A. CHRISTIAN, presiding.

Paper by DR. F. H. HEISE and MR. H. L. SAMPSON of Saranac Lake, New York.

Subject, "The Relation of the X-ray Findings to the Diagnosis of Pulmonary Tuberculosis."

DR. HEISE opened his talk with a few preliminary remarks regarding the types of lesions in pulmonary tuberculosis, together with their pathology, and what this pathology may be expected to show in

the x-ray. He emphasized two classes of findings: (1) The nodular densities of linear form. (2) The mottling or non-linear type of density. He then took up the question of terminology as applied to x-ray findings in lungs, calling attention to the so-called "bronchial shadows" and the shadows due to actual tubercles.

For purposes of diagnosis two classes of x-rays of the chest are found useful: Group I, those which show bronchial and peri-bronchial densities. Group II, those which show "parenchymatous" densities. In regard to the latter group special attention should be placed on the irregular "mottling" and the "annular" densities. There is always greatly lessened transmission of light and the density may be very great even without fluid present. In Group I, actual tuberculosis is present only in a very low percentage of cases. In Group II, however, the percentage is very great. Of the cases in both groups associated with tubercle bacilli in the sputum, Group I showed a total of 6%, while Group II showed 94%.

The paper was accompanied by a demonstration of a large number of x-ray plates which illustrated the points in question.

DISCUSSION.

DR. VINCENT Y. BOWDITCH: Importance of x-ray in connection with clinical findings emphasized. Conservative attitude commended. Illustration of personal cases, calling attention to presence of density without clinical tuberculosis.

MR. H. L. SAMPSON: Emphasized the vague differences between actual "mottling" and linear nodules. Spoke of method of demonstrating cause of homogeneous character of shadow by splinting of opposite side.

DR. WALTER J. DODD: Group I,—the most puzzling problem which roentgenologists have to face. Age of patient very important. Increased density very significant in children. X-ray does not give positive diagnosis. Probable diagnosis much simpler in Group II.

DR. PERCY BROWN: Study of the lungs for pulmonary tuberculosis should begin in infancy and be carried on throughout life. Question should be, How early in life can we diagnose tuberculosis by x-ray? Differences between linear dotting and the findings in Group II not clear. Instead of calling shadows "tubercles," we should speak of them as "peri-tubercular processes." Fan-shaped distribution of mottling emphasized.

DR. FRANCIS H. WILLIAMS: The fluoroscopic examination, interpretation of plates and physical examination should all be done by the same person to get best results. X-ray should be a part of the physical examination.

DR. HEISE: In a series of 1,500 cases of hemoptysis with tubercle bacilli in sputum, the cause of death in 90% was pulmonary tuberculosis. When tubercle bacilli were not present, tuberculosis was cause of death in 70%. Question of correctness of term "tubercle" somewhat confused.

GILBERT HORRAX, *Secretary pro tem.*

It has been demonstrated in Germany, France and England that the payment of a small cash allowance to nursing mothers helps to discourage bottle-feeding and diminishes infant mortality.

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THURSDAY, MAY 11, 1916

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HARVARD MEDICAL AND DENTAL SCHOOLS. REPORTS OF THE PRESIDENT AND OF THE DEAN.

THE recently published annual report of President Lowell on the activities of Harvard University for the year 1914-15, refers in considerable detail as follows to the work of the Harvard Medical School in dispatching surgical units to the American Ambulance Hospital and to field hospitals in the British Army medical service. This description of the service of these units may be taken as the official statement of their intent and accomplishment.

"To the general public the most interesting event during the past year has been the work in military hospitals in Europe. Thanks to a gift by Mr. William Lindsay, it was enabled to take its turn among the leading medical schools of the United States in providing for three months, from April 1 to July 1, the surgical staff of the University service in the American Ambulance (Hospital) at Neuilly-sur-Seine. This first Harvard Unit, as it was called, went under the

charge of Dr. Harvey Cushing as surgeon, and Dr. Robert B. Greenough as surgeon and executive officer, and comprised four operating-room nurses.

"Dr. Richard P. Strong, well known for his work on tropical diseases in the Philippines and in South America, and for his study of pneumonic plague in China, accompanied the unit as bacteriologist; but he had hardly arrived in Paris when he was called away to take the position of director of the American Red Cross Sanitary Commission to suppress the epidemic of typhus fever in Serbia. In an astonishingly short time the confidence of the Serbian authorities was won, the work organized, and, in spite of an almost total lack at the outset of the ordinary medical equipment for combating an epidemic, the disease was in a few months almost wholly suppressed.

"While the first unit was in France, a request came from the British Army Medical Service to a number of American universities for surgical units on a much larger scale—no less than thirty-two surgeons and seventy-five nurses apiece—to take charge for six months of field hospitals of one thousand beds. The University of Chicago sent a unit without delay. Representatives of Harvard, Columbia, and Johns Hopkins met, and being already somewhat depleted by surgical services in Europe, agreed to maintain between them a unit for six months. Harvard offered to take the first three months, and Dr. Edward H. Nichols undertook to recruit and lead the unit, with Mr. Herbert H. White as the business manager in charge of the preparations. These were, of course, difficult and exacting. In a very short time an efficient staff and nurses had to be enrolled; passports, transportation, instruments and supplies procured, and money raised—for although the English government furnished transportation and uniforms, with maintenance and daily pay at the usual army rates, several thousand dollars were needed for the instruments, for equipment and for the transportation of surgeons and their substitutes who could not remain the whole three months. The complete unit sailed on June 25, and was sent to a hospital in France under the command of Lieutenant-Colonel Sir Allan Perry.

"At the close of the three months it became evident to the British government that such a period was too short to justify the expense of transportation from America, and, therefore, the contingents from Columbia and Johns Hopkins did not go. But some members of the Harvard staff, with about half of the nurses, volunteered to stay on, and there arose a strong desire to renew the unit if needed. The money required was in part given, in part derived from the proceeds of a collection at the Harvard-Yale game; and a third Harvard unit was recruited, this time for six months. It sailed on November 14, with thirty new members of the staff and thirty-six more nurses, under the lead of Dr. David Cheever.

"The devotion of the surgeons and nurses, their willingness to do any work that fell to their lot, and their skill in treatment, has done us honor. It is gratifying to observe how few deaths and how few amputations occurred in either of the hospitals. By using to the fullest extent the resources of antiseptic surgery, almost all lives and limbs were saved. Above all, the work of our dentists—Dr. Potter at Neuilly, Dr. Kazanjian at the British hospital, and their colleagues—was a source of admiration. Their ingenuity in restoring jaws and teeth, apparently wholly destroyed, excited surprise and wonder abroad. Were it not that a prophet is not without honor save in his own country, it would be incomprehensible that the benevolent public here should leave with so little support a dental school which is doing such excellent work with wholly insufficient means."

President Lowell thus refers to the service and need of both the Medical and the Dental Schools. In the same volume of the official register of Harvard University appear also the special reports of the deans of the Faculty of Medicine, of the Medical School, the Graduate School of Medicine and the Dental School, with a section by Dr. Richard P. Strong on the work of the second academic year of the Harvard School of Tropical Medicine. It is impracticable at present to comment in detail on these special reports, but it is hoped that during succeeding weeks a series of editorials may be presented dealing singly with the work of certain departments of the Medical and Dental Schools.

MILK AND BABY HYGIENE ASSOCIATION.

THE seventh annual report of the Milk and Baby Hygiene Association for the year 1915 shows a gratifying increase in the work of that organization. The number of babies supervised during 1914 was 4,097; in 1915, 4,792. This is an increase of 250% since the year 1910, the first year of the Association. The report of the chairman of the board of trustees states that during the past year the Association has been able to save about 1200 babies. If we accept the figures of Professor Irving Fisher, that the economic value of a baby is \$90, the reduction of infant mortality due to the efforts of the Association represents a saving to the city of \$108,000. This has been achieved by the expenditure of \$25,000.

The function of the Association is to keep well babies well. The three ways by which this is accomplished are, first, the encouragement of breast feeding; second, the provision of pure milk at cost for mothers unable to nurse their babies sufficiently or at all; third, the teaching to mothers by specially trained physicians and nurses not only proper feeding, but also proper infant care and hygiene. Twelve stations located in the more crowded and needy parts of the city have been established. Not only do the mothers bring their children to these stations for supervision, but from them nurses are sent out to demonstrate in the home proper methods of caring for the baby in other ways. It goes without saying that such instruction must exercise a beneficial effect upon the general conditions of homes and must be, therefore, an important influence in the preservation of health among those families reached by the Association.

The extension of the good work which can be done by this Association is directly dependent upon its financial support. The foundation of an endowment fund by a gift of \$10,000 to the trustees in memory of Caroline Louise Moseley is but the beginning, it is hoped, of a financial strength which will enable the Association to extend its valuable services just as far as they may be needed.

"DENTAL HYGIENISTS."

MORE and more the importance of dental hygiene, particularly for school children, is being recognized. In a recent address at the Forsyth Dental Infirmary for Children, the director of that institution emphasized the dangers of poor teeth in school children both for themselves and for others. "All must share in the morbid pathological conditions of the neglected child, and this is particularly true concerning tooth and mouth conditions. The time is rapidly approaching when a child will not be allowed to enter a public school until he is physically fit." Even disease of the first teeth, which have been too often disregarded because of their transient nature, is capable of producing lasting effects upon the child. When the temporary teeth are lost prematurely, the permanent teeth erupt unassisted into various conditions of irregularity and malocclusion, which greatly interfere with the growth of bones of the head. Deformities of the nose and mouth may result, which interfere

with respiration and with voice production. Absorption from septic processes in the mouth has been much discussed of late.

Granting the truth of these facts does not settle the problem. The question of how to get so many thousands of mouths cared for, presents a number of difficulties. The interest recently aroused in dental hygiene has flooded the dentists with work. Many people cannot afford regular dentists' fees for cleaning, and the elementary part of the work, which is sufficient for the teeth of many children, should not require the time of a dentist.

Laws dealing with this situation have been enacted in Massachusetts and Connecticut, and now the Governor of New York State has recently signed a bill which provides for the training, registration and licensing of the "dental hygienist." The new law provides that any dental dispensary or infirmary, legally incorporated and maintaining a proper standard and equipment, may establish for women students a course of study in oral hygiene. One year's attendance at high school and one year's training in oral hygiene are required to become a licensed "dental hygienist." The person so licensed "may remove lime deposits, accretions, and stains from the exposed surface of the teeth, but shall not perform any other operation on the teeth or tissues of the mouth."

It is to be hoped that plenty of "dental hygienists" will be developed and that the portion of the public, who heretofore have been unable to afford dentists' services save for the worst toothaches, will appreciate the value of clean mouths and avail themselves of the opportunity.

A more detailed account of the need for such services and of the regulations which protect the public from their improper use will be found on page 697 of this issue of the JOURNAL.

A COURSE IN MILITARY MEDICINE.

THE attention of those interested from any point of view in military medicine is called to the announcement on page 696 of this issue of the JOURNAL of the course which will be given this summer at the Harvard Medical School. It would seem that such a course, apart from its practical value, would be most interesting. The JOURNAL takes this opportunity of presenting the prospectus for the consideration of its readers.

MEDICAL NOTES.

INFANTILE SCURVY AND PASTEURIZED MILK.—In the discussion of Dr. Funk's paper on "Vitamines; a New Factor in Nutrition," read before the New York Academy of Medicine recently, Dr. L. Emmett Holt expressed the opinion that infantile scurvy was undoubtedly on the increase in that city and that the increase was due to the exclusive use of pasteurized milk in the artificial feeding of infants. That this conclusion is probably correct is indicated by the interesting clinical observation reported by Dr. Alfred Hess at the same meeting. Hess found that a mild grade of scurvy developed in a group of infants artificially fed on pasteurized milk and barley water, while a control group to whose diet orange juice was added, but who otherwise received the same milk modifications as the first group, remained entirely free from scurvy. In the first group the scorbutic symptoms promptly disappeared on the administration of orange juice.

The New York Department of Health expresses itself as deeply interested in these papers and in the discussion which followed. The Health Department takes the position that these facts do not constitute an argument against the pasteurization of the milk supply, but that they should be considered as a warning against the temporary disabilities which may be produced by the exclusive use of pasteurized milk. The need of a supply of safe, raw milk (guaranteed or certified), which may be used by those cases in which pasteurized milk, even with the addition of anti-scorbutics, does not meet the requirements, is emphasized.

PHYSICIANS INVITED TO SPECIAL PEDIATRIC CLINICS DURING BABY WEEK.—In connection with the activities of the Mayor's Baby Week Committee in New York City, arrangements have been made for conducting a large number of pediatric clinics in the various child-caring institutions in that city. The list of clinics serves as an indication of the wealth of clinical instruction in pediatrics available in the city; the list is an imposing one and includes a large number of clinics by men of wide reputation. Laymen are not admitted, but all physicians are cordially welcome.

CRAIG COLONY FOR EPILEPTICS.—The twenty-second annual report of the Craig Colony for Epileptics records in extensive detail the work of that institution for the year ended October 1, 1915. There were 241 patients admitted during the year, making the total number of patients in the Hospital on September 30, 1915, 1,477. The report contains a considerable number of case reports, statistics of the patients, pathological reports illustrated with cuts, and concludes with a series of diagrams and charts used at the last State Conference of Charities and Corrections.

MODEL HOMES PLANNED FOR WASHINGTON.—Plans have just been completed for the erection of a series of model homes in Washington for the purpose of demonstrating to the nation the relationship between good housing and good health. These are to be known as the Ellen Wilson Homes and are not in the nature of an experiment, but are intended as a demonstration to the entire United States. This step is being taken with the desire to rid the Capital of the alley dwellings which have long been a matter of concern, both to health authorities and to public spirited citizens. The experience of Liverpool has shown that the building of dwellings with sufficient light, air and sanitary arrangements has decreased not only sickness and death, but also vice and crime. These changes have taken place in spite of the fact that the population living in the new dwellings is in some areas 99% the same as that which lived on the same area in the old buildings.

WORK OF THE NAVY MEDICAL CORPS.—In his address before the graduating class of the Navy Medical School on April 12, 1916, Rear Admiral William C. Braisted, Surgeon General of the Navy, reviewed the work of the present administration of the Navy Department in so far as it affected the medical corps of that service. The Secretary of the Navy has recommended to Congress the increase of the medical corps from 346 to nearly 500, and has made provision for the increase in the hospital corps of nearly 11,000 men. He has established two of the finest hospital corps training schools in the world for the training of male nurses, and has made provision for building a specially designed hospital ship. Schools have been established in Samoa and Guam for training the native women in nursing; and in Hayti, medical officers and nurses have been furnished to assist in the service. A naval medical reserve corps has been instituted and five Red Cross hospital units (mobile hospitals of 250 beds each) are now being organized.

STREET ACCIDENTS—A FREQUENT CAUSE OF DEATH.—According to statistics prepared by the New York Police Department, the total number of street accidents in New York City during 1915 was 22,540, of which 659 were fatal. Of the persons killed, 510 were male and 149 female, *i.e.* about three and a half times as many males as females; 106 were children under 6 years of age, and 184 were between the ages of 6 and 16.

In the non-fatal accidents the proportion of male and female was similar to that just noted, and there were 2301 children under 6 years and 5085 between the ages of 6 and 16 years.

As to causes, the largest contributors were the following, in the order of importance: passenger automobiles, 4865; electric street cars, 3028;

falls, due to causes other than vehicular, 3005; horse-drawn vehicles, trucks or wagons, 2441; and collisions of all kinds, 2428. The other establishment of sanitary conditions in the Island. causes of accidents are comparatively small.

It seemed of interest to discover, if possible, just what class of vehicle was responsible for the largest proportion of street accidents in New York City. Inasmuch as this detailed information is ordinarily not tabulated by the Police Department, a special tabulation was made of all street accidents, occurring in February, 1916, during which month there were 1407 accidents. Of these, 523 were caused by vehicles striking persons. In contradiction to the popular impression, only two of these accidents were caused by ambulances, one by a fire engine, three by omnibuses and five by mail wagons. According to the Police Department, this proportion of cases is typical of conditions generally, only a very small proportion of the street accidents in this city being due to the vehicles mentioned.

On the basis of the above figures, Dr. E. H. Lewinski-Corwin has computed that there was only one ambulance accident to every 5042 runs, and one fire engine accident to every 4491 runs. These figures speak eloquently for the general care employed by the drivers of these vehicles.

It may be of interest to see the distribution of accidents throughout the months of the year. The total number which occurred in New York City last year was 22,540. In January, 1580; February, 1359; March, 1725; April, 1953; May, 2041; June, 2118; July, 2291; August, 2071; September, 2126; October, 2084; November, 1648, and December, 1541. From these figures it is easily seen that during the summer months the frequency of accidents is greater than during the winter months.

BOSTON AND NEW ENGLAND.

MATERNITY INSURANCE.—In connection with the propaganda of infant hygiene now being carried on by the Mayor's Baby Week Committee, a determined effort is being made to arouse interest in maternity insurance as a powerful factor in the reduction of infant mortality. At the present time, hundreds of mothers who should be at home nursing their babies are forced, by economic pressure, to work in shops and factories, leaving their little ones, meantime, in the care of a neighbor or a day nursery. That means rising with the break of day, eating a hurried breakfast, perhaps nursing the baby at the breast, taking the infant to the day nursery and getting to the factory by eight o'clock. After at least eight hours of hard work, the tired mother must again take charge of her little one. Is there any wonder that the mortality among such infants is high?

With maternity insurance such conditions would be unknown; the mother would be sub-

sided by the state to provide proper care for her child at home. Our present methods are palliative when they should be preventive. Certainly no more effective plan than maternity insurance can be devised to deal with this phase of infant mortality.

HOSPITAL BEQUESTS.—By the will of the late Mrs. Alice Joy Mason of Newton, Mass., the Boston Floating Hospital is the recipient of \$1000.

The will of John W. Wheelwright of Boston, Mass., bequeaths to the Massachusetts Eye and Ear Infirmary the sum of \$2000.

MEASLES IN BOSTON.—There has been reported a total of 259 cases of measles in Boston, an unusually large number at this time of year. The cases, however, have been mild and no deaths have resulted.

MASSACHUSETTS VETERINARIAN ASSOCIATION.—At the 32d annual meeting of the Massachusetts Veterinarians' Association the following officers were elected: president, Dr. Harry W. Pierce of Medford; first vice-president, Dr. W. H. Dodge of Leominster; second vice-president, Dr. W. M. Simpson of Malden; secretary-treasurer, Dr. E. A. Cahill of Lowell. Dr. Adolph Eichorn, chief of the pathological bureau of the United States Bureau of Animal Industry at Washington, gave an address on "Biological Therapeutics." Dr. F. M. Perry of Framingham, Mass., related experiences in shipping horses to the Allies.

MALDEN HOSPITAL NURSES' GRADUATION.—At the recent annual graduation exercises of the Malden Hospital Training School for Nurses seven diplomas were awarded. Miss E. M. Nichols, of the Boston City Hospital School for Nurses, delivered an address to the graduates.

SILENCE ZONES IN BOSTON.—Silence zones for hospitals accommodating fifty or more patients have been established by the City Council of Boston after a delay of months following the discovery that an ordinance previously reported to the committee was so worded as practically to prevent the playing of a piano anywhere in the Back Bay. The ordinance will go into effect June 1. It reads as follows: "The commissioner of public works shall, at the request of the authorities of a hospital, place and maintain a sign or signs displaying the words: 'Warning! Hospital! Make No Noise!' at such points as he may determine on public streets and places in the vicinity of hospitals accommodating more than 50 patients. No foot traveler, driver of vehicle, motorman of a street car, or operator of a motor vehicle shall make any unnecessary

noise in the vicinity of such hospitals as to unreasonably disturb patients therein."

CONNECTICUT STATE MEDICAL SOCIETY.—The one hundred and twenty-fourth annual meeting of the Connecticut State Medical Society will be held at Hotel Stratfield, Bridgeport, Conn., on May 17 and 18th, 1916. The first meeting of the Council will be held at 9.30 A.M. on Wednesday, May 17, and the first meeting of the House of Delegates will be held at 10 A.M. Wednesday. All members of the Society are at liberty to attend the meetings of the House of Delegates.

On Wednesday at 2 P.M., the following program will be given: "The Prevention of Blindness in Infancy and Childhood," Eugene M. Blake, New Haven; "What Attitude Should the Physician Take Toward Sickness Insurance?" George Blumer, New Haven; "Onanistic Dyspepsia," Louis M. Gompertz, New Haven; "Results of Routine Study of the Placenta," J. Morris Slemmons, New Haven; "Mental Defectives," Paul Waterman, Hartford.

Thursday morning, May 18th, 9.30 o'clock: "The Contribution of the Roentgen Ray to Gastrology," W. A. LaField, Bridgeport; "Lessons Learned from the Work of the Past Year," E. J. McKnight, Hartford; "Motion Picture and Lantern Slide Demonstration of Methods of Precision in the Treatment of Fractures," George W. Hawley, Bridgeport; "Motion Picture Demonstration. Operations: Bone Graft for Pott's Disease, Bone Graft Peg for Fracture Neck of Femur, Inlay Graft for Fracture of Long Bones, etc.," Fred H. Albee, New York City, (by invitation).

Thursday afternoon, May 18th, 2.30 o'clock: President's address: "Some Defects and Inconsistencies in Connecticut Statutes and Medico-Legal Procedures," Max Mailhouse, New Haven; "The Clinical Study of the Respiration," David L. Edsall, Boston, Professor of Clinical Medicine, Harvard University; "Some of the Commoner Irregularities of the Heart," Charles W. Gardner, Bridgeport; "The Starvation Treatment of Diabetes," Walter R. Steiner, Hartford. The annual banquet will be held on Thursday evening, May 18.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending May 6, 1916, there were 268 deaths reported, with a rate of 18.38 per 1,000 population, as compared with 271 and a rate of 18.88 for the corresponding week of last year. There were 39 deaths under 1 year as compared with 52 last year, and 85 deaths over 60 years of age against 82 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 64; scarlet fever, 68; measles, 201; whooping cough, 45; typhoid fever, 1; tuberculosis, 64.

Included in the above were the following cases

of non-residents: Diphtheria, 7; scarlet fever, 22; measles 1; whooping cough, 1.

Total deaths from these diseases were: Diphtheria, 4; scarlet fever, 2; whooping cough, 4; tuberculosis, 25.

Included in the above were the following deaths of non-residents: Diphtheria, 1; tuberculosis, 3.

EUROPEAN WAR NOTES.

WAR RELIEF FUNDS.—On May 6, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund.....	\$115,333.20
Serbian Fund.....	91,006.01
Allied Fund.....	93,331.36
French Wounded Fund.....	79,145.34
French Orphanage Fund.....	42,443.22
Armenian Fund.....	38,426.03
Surgical Dressings Fund.....	23,954.17
Italian Fund.....	17,179.86
Facial Hospital Fund.....	10,853.00
Artificial Limbs Fund.....	6,374.00

Obituary.

SAMUEL F. COUES, M.D.

DR. SAMUEL FRANKLIN COUES, second oldest living graduate of Harvard College, died May 1, 1916, at his home at 10 Mason Street, Cambridge. He was in his ninety-first year.

Dr. Coues was born in Portsmouth, N. H., in 1825. He was the son of the late Samuel E. Coues, a merchant of that town, and Clara Pierce, daughter of William Pierce of Gloucester. He was descended from Peter Coues, also a resident of Portsmouth, who was at one time sailing master in the British Navy of the noted ship of the line, the *Royal George*.

Dr. Coues was graduated from Harvard College in the class of 1845, and is survived by Dr. N. E. Soule, his classmate, and by William Henry Davison. Dr. Coues received his M.D. from the Jefferson Medical College in 1849, entered the United States Navy as an assistant surgeon on February 25, 1851, and was made medical director August 13, 1876, with which rank he was retired in September, 1887.

Dr. Coues made a three years' cruise around Cape Horn, on board the sloop of war *Portsmouth*, at that time the finest vessel of her class, both as to sailing qualities and armament, in any navy. He served all through the Civil War, either on board ship or in charge of naval hospitals. He married Mary B., daughter of George and Elizabeth E. Hughes of Boston. Since his retirement he had made his residence in Cambridge, and is survived by three sons, Dr. William Pierce Coues of Boston, Robert W. Coues of Cambridge and Franklin Coues.

Miscellany.

MILITARY MEDICINE AT HARVARD.

A COURSE of twenty-three lectures on Military Medicine will be offered in July and will be repeated in August. The hour of five in the afternoon has been chosen as most convenient for students who are pursuing other courses in the Graduate School. The lectures will be given daily, except Sundays, July 5 to 31 inclusive; and in August daily, except Saturdays and Sundays.

The main part of the course will consist of sixteen lectures by Major W. P. Chamberlain of the Medical Corps of the Army, Lecturer on Military Medicine, as follows:

SCHEDULE OF LECTURES BY MAJOR W. P. CHAMBERLAIN.

1. History of Military Medicine and Its Contributions to Science. Notable Work of Certain Military Surgeons.
 2. The Medical Department of the United States Army. Duties Devolving on the Medical Department in Peace and in War.
 3. Records of the Medical Department. Supplies for Medical Department. Methods of Obtaining and Accounting for Same. Samples of Medical Equipment to be Shown.
 4. Examination of Recruits for the Army. Fundamental Importance of the Subject. Bearing on Pension Claims.
 5. Military Sanitation in General. Housing, Feeding, Clothing and Equipping the Soldier.
 6. Personal Hygiene. Hygiene of Hot and Cold Countries. Sanitation of Troop Ships and Troop Trains.
 7. Principles of Marching. Hygiene of Marching Commands. Camp Sanitation.
 8. Diseases Prevailing among Soldiers and their Prophylaxis. Important Bearing of these on Outcome of Campaigns.
 9. Medico-Military Statistics. Bearing on them of Age, Length of Service, Arm of Service, Station and Race. Acclimatization in Tropics.
 10. Military Weapons and the Character of the Wounds they Produce. Gas Poisoning.
 11. Nature and General Treatment of Wounds in War. Difference between Civil and Military Practice and Reasons therefor.
 12. Organization of the Army. Line. Staff. Sanitary Units in the Field. Ambulance Companies, Field Hospitals, Hospital Trains, Hospital Ships, etc.
 13. Lines of Medical Aid on the Battle Field. Hospital Corps Drill. Evacuation of the Wounded. Importance of Prompt Evacuation.
 14. Tactical Knowledge Needed by Medical Officers. Map Problems.
 15. The Geneva and The Hague Conventions. The Red Cross Society.
 16. Medico-Military Preparedness.
- In addition, two lectures on "Military Sur-

gery in the Navy" will be given by a naval surgeon; four lectures on "Military Surgery in the European War," by members of the Harvard Units who have recently served abroad in the present war; and one lecture on the "Department of the Militia," by Surgeon-General Frank P. Williams of the Massachusetts Militia.

The object of the course is to acquaint physicians, as far as may be done by lectures, with the duties of a surgeon in the Army, so that they may be better prepared to assume such duties in case of emergency. The course will also be valuable for those who contemplate entering the Medical Reserve Corps of the Army.

The course is open to graduates in medicine and also to undergraduates of Class A medical schools.

The lectures will be given at the Harvard Medical School.

Fee, \$10; for students registered in the Graduate School of Medicine, \$5.

DENTAL HYGIENISTS.

By EDWARD F. BROWN,

Secretary, Dental Group, Advisory Council, Committee on Child Hygiene, New York City Health Department.

A MONOGRAPH of the Department of Health of the City of New York states that it is safe to assume that not less than ninety per centum (832,500) of school children of the city are in need of dental treatment. It may be said that this situation is due to imperfect tooth structure, the causes of which lie partly, at least, in prenatal malhygiene, improper feeding of children, lack of cleansing, and neglect to prevent progressive decay by early professional treatment. The insidious character of tooth decay and disease is becoming increasingly apparent from the scientific relationships being drawn between oral malhygiene and disease. There are hardly enough licensed dentists to repair the dental ills of the school population alone. This situation, engaging the attention of school hygienists, has directed attention to new means of attacking this problem. It was apparent that little was to be expected from curative channels in any effective program of action. Prevention is the keynote of modern health work. Inasmuch as the prophylactic principles of dentistry are defined, it was patent that the solution lay in this direction.

For some time Dr. Alfred C. Fones of Bridgeport has been successfully experimenting in the use of so-called "dental hygienists," or specially trained women who give surface treatment to the teeth of school children.

Last spring Dr. Philip Van Ingen, chairman of the Committee on Child Hygiene of the Advisory Council of the Health Department of

New York, in conference with the Health Commissioner appointed the following members of the advisory council of the department a committee to study, report and recommend as to the desirability of utilizing dental hygienists in New York: Dr. Herbert L. Wheeler, chairman, Dr. M. L. Rhein, Dr. Homer C. Groscup, Dr. Arthur H. Merritt, Dr. Henry C. Ferris, and Edward F. Brown of the Bureau of Welfare of School Children, Association for Improving the Condition of the Poor, as secretary.

The committee held a number of meetings, and on February 8, 1916, submitted the following unanimously:

"The sub-committee on dental hygienists held three meetings, at which time the question of dental hygienists was thoroughly discussed. The committee now begs leave respectfully to report that a trial of surface cleansing of teeth of school children, with accompanying instruction in oral hygiene, be commended at the earliest possible moment in one or more centers, preferably public schools, provided that the work be done by specially and adequately trained persons and under the supervision of competent directors."

On February 17, 1916, the whole Committee on Child Hygiene of the Advisory Council ratified the report and recommendations of the sub-committee.

Dr. Haven Emerson, Commissioner of Health, has evidenced the keenest interest in this work, and it appears probable that at an early date some nurses will be assigned to this work.

At one time there appeared to be some question as to the legality of employing dental hygienists. The question was submitted to the Corporation Counsel by the Health Commissioner, who reported that there is nothing in the dental law to prevent the use of dental hygienists.

In order, however, to avoid any possibility of untrained persons entering upon the work without proper legal safeguards to prevent fraud, inefficiency and exploitation, the legislature passed a bill (Senate Bill No. 391), which has just been signed by Governor Whitman, the provisions of which on this subject are as follows:

"Any dental dispensary or infirmary legally incorporated and registered by the regents, and maintaining a proper standard and equipment, may establish for women students a course of study in oral hygiene. All such students upon entrance shall present evidence of attendance of one year in high schools and may be graduated in one year as dental hygienists, upon complying with the preliminary requirements to examination by the board, which are:

"a. A fee of five dollars.

"b. Evidence that they are at least twenty years of age and of good moral character.

"c. That they have complied with and fulfilled the preliminary and professional requirements and the requirements of the statute.

"After having satisfactorily passed such examination, they shall be registered and licensed as dental hygienists by the regents under such rules as the regents shall prescribe.

"Any licensed dentist, public institution or school authorities may employ such licensed and registered dental hygienists. Such dental hygienists may remove lime deposits, accretions and stains from the exposed surfaces of the teeth, but shall not perform any other operation on the teeth or tissues of the mouth. They may operate in the office of any licensed dentist, or in any public institution or in the schools under the general direction or supervision of a licensed dentist, but nothing herein shall be construed as authorizing any dental hygienist performing any operation in the mouth without supervision. The regents may revoke the license of any licensed dentist who shall permit any dental hygienist operating under his supervision to perform any operation other than that permitted under the provisions of this section."

This law follows the enactment of similar ones in Massachusetts and Connecticut. With these progressive steps taken, it is to be hoped that through prevention we will preclude the possibility of another generation of children growing up, 90% of whom will be exposed to the havoc wrought by diseased and rotting teeth.

COMPULSORY HEALTH INSURANCE.

IN the issue of the JOURNAL for April 6 we commented editorially on the compulsory health insurance bill now pending before the Massachusetts General Court. A similar measure, known as the Mills' bill, has also been introduced before the New York General Assembly at Albany, and has been editorially commented on as follows in a recent issue of the *New York Tribune*. This comment appears pertinent as representing the attitude in another community towards the subject of compulsory health insurance.

"The theory of health insurance embodied in Senator Mills' bill is a legitimate and logical companion to that of payment for industrial accidents, which this state has already adopted. This bill provides for compulsory insurance for all manual laborers and others earning less than \$100 a month. The cost is to be borne two-fifths by the worker, two-fifths by the employer, and one-fifth by the state. The benefits are medical and nursing attendance, a sick benefit payable after the fourth day of illness, continuing for twenty-six weeks, and a funeral benefit of not more than \$50. The administration of the funds collected is to be by a joint association of employers and employees, according to trades, under state supervision.

"Such a proposal is essentially no more radical than that for compensation for industrial

accidents. It has in its favor practically the same arguments as those to be made for the older and better known form of social insurance. Existing in some form in eleven European countries, health insurance has been pretty thoroughly tested and adjudged successful. Illness is an economic loss. It can be prevented to a considerable extent. This measure provides for a sharing of the burden of insurance costs by employers and workers, because both must co-operate to prevent illness; it provides for a state payment because disease means poverty, and the state inevitably bears a good part of the burden of poverty, in maintenance of clinics, hospitals and state institutions of various kinds.

"Experience under the workmen's compensation act has proved, once the employers were sharply urged thereto by the cost of the system, the possibility of checking the number of accidents by adoption of modern and scientific methods of operation. The result has been beneficial to them as well as to the employees, who found in the system a form of relief far more satisfactory than the old suit at law, with its ambulance-chasing lawyers, its delays, its uncertainties. These classes having benefited, the community at large also was better off.

"Inevitably that will be true through the establishment of health insurance. Campaigns for 'Health First' will spring up, as did those for 'Safety First.' Employers will learn that their business methods are susceptible of improvement to lessen sickness and disease among workers. That will mean greater working capacity, greater earning capacity for employees, and in time less drain on the public's charity, now the sole resource of the low paid worker, broken down and unable to care for himself."

Correspondence.

AN APPRECIATION.

BOSTON, MASS., March 25, 1916.

Mr. Editor:

With inexpressible edification I have just read, in the April number of the *American Magazine*, Dr. Richard C. Cabot's article on *better doctoring for less money*. The italicized words constitute the gripping title of this article and betray the writer's astute cognizance of the long-established fact that ours is a nation of shrewd-bargaining shopkeepers.

To avoid possible acrimonious controversy over the above characterization of our people, let me hasten to say that it is based entirely upon the appreciation of distinguished alien intellectuals, shocked at our amazing and incoercible cultural ineptitude. Leigh Hunt, for instance, as James Russell Lowell, in his delightful essay, "On a Certain Condescension in Foreigners," told us nearly half a century ago, could never think of America without seeing a gigantic counter stretched all along the seaboard. And, in very recent times, equally distinguished and sympathetic observers, some of English, others of Germanic origin, have made it unmistakably clear to us that, while culturally we are of the order of *osteoccephali*, our ability to get the best of a trade is quite beyond dispute.

Curiously enough, in spite of this, our world-acknowledged perfection in sharp dealing, it remained for Dr. Cabot to bring home to us in his inimitable way, the startling fact that, for a regrettably long period of years, our laity have been stupidly oblivious to the fact that the self-same shrewd principles which have established their supremacy in wholesale dealing in rum, cotton, molasses and shoe strings, for example, are equally applicable—to their immense profit, withal—in their dealings with doctors of medicine.

The manner of Dr. Cabot's article is equally attractive with its matter and evidences a profound and sympathetic understanding of the shopkeeping American's fondness for the easily intelligible *argot* of commerce—the stuff with the punch. He tells us, among other things, that:

"A new era has come in the practice of medicine, but most people do not know it yet. We have begun to emerge from that stage of medical work in which the doctor was a peddler, selling goods from house to house, into the more advanced and sensible era in which the doctor stays at his place of business, like anyone else who has goods to sell, and the people who want those goods come to him. The shop where he has his goods to sell is generally called a hospital, and he has associated with him there a body of men and women similar to work people, foremen, and managers of any industrial plant or dry-goods store. He has there some beginnings of a satisfactory division of labor and specialization of function. Therefore he can give the public a much better article for less money. The 'article' I refer to is sound medical advice and treatment."

In a similar vein Dr. Cabot goes on as follows:

"The patient who pays me a fee in my office would usually refuse to go to a free hospital on the ground that he is a self-respecting person and does not want to be treated like a pauper. On the other hand, he cannot possibly get the hospital grade of diagnosis and treatment by trotting around from specialist to specialist, because he cannot afford the ruinous expense attendant upon such a course. Hence, he has to be content, or discontent, with second-rate medical work. He has come to a cobbler to buy a pair of shoes, that is, to a man who makes the whole shoe himself, unaided. It is one hundred to one that he will get a poorer article and pay more for it than his friend who buys a factory-made shoe into the manufacture of which the skill of many has entered.

"The industry of the modern private doctor can be justly compared to that of the cobbler or the peddler. There he sits in his office and, like the cobbler, does a complicated piece of work with his own unaided hands; or he hurries from house to house like the peddler, and sells such goods as he can carry about alone. *Far too weak in his own brain and body* to carry about from house to house the resources of modern scientific medicine, he cannot pack into his grip an up-to-date x-ray machine, a selection of guinea pigs, rabbits, sheep or other animals which may be necessary for the performance of modern laboratory tests. It is really grotesque even to attempt a mental picture of the burden under which the family practitioner would stagger if he seriously undertook to give his patients the best that medical science today can provide, yes, can provide cheaply, too.

"By a curious combination of ignorance and misinterpretation, the general public today still believes that it is a luxury to be able to call a private physician to one's house, and a misfortune to go to a hospital as a patient. Exactly the opposite is the truth. Those who attend the best of our large public hospitals, free or for trifling fees, are really the aristocrats among patients. Those who call a physician to their houses or visit him at his office are the unfortunates, doomed to pay high for a relatively poor bit of service."

If any criticism is to be made of this contention of Dr. Cabot's with regard to the superiority of hospital treatment, it is to the effect that he is much too modest about it all. He should tell the public plainly that if the scene of the group workers' activities in a given case chances to be the out-patient department, the sufferer will there encounter much to cheer and delight him. He will, for example, find the "lounge" or waiting-room, with its green or dull gray walls simply adorned with a neatly-framed copy of the hospital rules and regulations, its warm cement floors and its settees of soft pine, a perfect marvel of restfulness; and that, if a stay in hospital is found necessary for the complete ministrations of the group workers, the patient is bound to sink with a sigh of comfort into his downy, stork-legged, white-enamelled iron cot, in a charming cubicle with its "mission" easy chair, its Grands Rapids antique furniture and its priceless art-square floor covering, and there find surcease of worry in the lulling calm of a hospital atmosphere.

Under such conditions one can, if anywhere, really enjoy to the full the rapturous thrills which accompany spinal punctures, the blinding pleasure of ophthalmoscopic examinations, the languorous delight, leading almost to the point of faintness, which attends the taking of the blood-pressure and lays the foundation for the blood-pressure habit which everyone should acquire; and, finally, supreme of all joys—the x-ray examinations.

Dr. Cabot, in his article, lays repeated stress upon the paramount rôle played by the last-named procedure in establishing the indisputable superiority of the "goods" of the "shop, generally called a hospital" over those of "medical peddlers." And he is entirely right in so doing, for if the researches of the group-working specialists have left undiscovered a spot of disease in some inaccessible corner of the anatomy, the x-ray, with unerring penetration, is bound to reveal it, thereby adding materially to one's hopes of speedy recovery.

I dare not occupy more of the valuable space in your columns with further excerpts from Dr. Cabot's article, much as I would like to do so for the enlightenment of the profession at large. I do not hesitate to say, however, that, if any practitioner ventures to doubt the general superiority of the ideals and ethical standards of the new era of medical practice heralded by Dr. Cabot, he will alter his viewpoint after turning to the various prefatory notes to "*Thorac Subscivæ*," by John Brown, M.D., LL.D., etc. There he will find a complete exposition of the absurd notions (now worn out and obsolete) which prevailed among the leading medical men of the mid-nineteenth century with regard to professional standards and practices.

From the above-mentioned prefatory notes I have made the following few selections. And, on second thought, it occurs to me that a critical study of them, fragmentary as they are, will doubtless serve to win the acclaim of the profession in its entirety for the practices and ethics of the new era that is upon us.

Let us note, first, the old-fogeyism of this passage:

"Our ordinary senses, our judgment and our law of duty, must make up the prime means of mastering and prosecuting with honor and success the medical, or indeed any other profession founded upon the common wants of mankind. Microscopes, pleximeters, the nice tests of a delicate chemistry, and all the transcendental apparatus of modern refinement, must always be more for the few than for the many. Therefore it is that I would insist more and more on immediate, exact, intense observation and individual judgment, as the mainstays of practical medicine. From the strenuous, life-long, truth-loving exercise of these, let no amount of science, however exquisite, decoy the student; and let him who has them not greatly long after, as he will not greatly miss, these higher graces of the profession. What will make a

valuable physician or surgeon now, and enable him when he dies to bequeath some good thing to his fellow men, must, in the main, be the same as that which made Hippocrates and Sydenham, Baillie and Gregory, what we glory and rejoice to think they are."

The same stricture applies to this:

"Diagnosis has been greatly advanced by the external methods of auscultation, the microscope, chemical analysis, etc., and there is (I sometimes begin to fear we must say *was*) a better understanding of and trust in the great restorative powers of Nature. The recognition of blood poisons, and of many acute diseases, being in fact the burning out of long-slumbering mischief, the cleansing away of the perilous stuff manufactured within, or taken in from without, as seen in a fit of gout; in all this we have gained more than we have lost (we always lose something), *but is the practical power over disease commensurate with these enlargements? Is our sagacity up to our science?*"

Again to this:

"Sagacity, manual dexterity, cultivated and intelligent presence of mind, the *tactus eruditus*, a kind heart, and a conscience, these, if there at all, are always at hand, always inestimable; and if wanting, 'though I speak with the tongues of men and of angels, I am as sounding brass, or a tinkling cymbal; and though I understand all mysteries, and all knowledge, I am nothing. I can profit my patient and myself nothing.'"

Still further, to this:

"When the modern scientific methods first burst on our medical world, and especially when morbid anatomy in connection with physical signs (as distinguished from purely vital symptoms, an incomplete but convenient distinction), the stethoscope, microscope, etc., it, as a matter of course, became the rage to announce, with startling minuteness, what was the organic condition of the interior—as if a watchmaker would spend most of his own time and his workman's in debating on the beautiful ruins of his wheels, instead of teaching himself and them to keep the *totum quid* clean and going,—winding it up before it stopped. Renowned clinical professors would keep shivering, terrified, it might be dying, patients sitting up while they exhibited their powers in auscultation and pleximetry, etc., the poor students, honest fellows, standing by all the while and supposing this to be their chief end; and the same eager, admirable, and acute performer, after putting down everything in a book, might be seen moving on to the lecture room, where he told the same youths *what they would find on dissection*, with more of minuteness than accuracy, deepening their young wonder into awe, and begetting a rich emulation in all these arts of diagnosis,—while he forgot to order anything for the cure or relief of the disease!"

And, finally, to this:

".....I cannot help alluding to the crying and glaring sin of *publicity*, in medicine, as indeed in everything else. Every great epoch brings with it its own peculiar curse as well as blessing, and in religion, in medicine, in everything, even the most sacred and private, this sin of publicity nowadays most injuriously prevails. Besides the bad moral habit this engenders, it breaks up what is now too rare, the old feeling of a family doctor—there are now as few old household doctors as servants—the familiar, kindly, welcome face, which has presided through generations at births and deaths; the friend who bears about, and keeps sacred, deadly secrets which must be laid silent in the grave, and who knows the kind of stuff his stock is made of, their 'constitutions,'"

It seems to me quite unnecessary to carry the comparison further. In closing I will say, however, that if, after the perusal of what I have written, there are still Thomases who doubt that the "medical goods" of the new era in medical practice are superior to those of the old, they will at least have the fairness to admit that these goods are cheaper.

Very truly yours,

J. W. COURTNEY, M.D.

EMPLOYERS' LIABILITY.

SOUTHBRIDGE, MASS., April 24, 1916.

Mr. Editor: It seems to me that a certain condition exists now in all of the towns and cities of Massachusetts, which ought to attract the attention of the medical profession, and also of the medical societies which are supposed to protect the interests of the members of the medical profession. The new laws which have been enacted, about employers' liability, have made the members of the corporations wise. They have hired, at a nominal sum, some nurse who is perhaps a registered nurse, but certainly not a registered physician, and that nurse does not only give first emergency treatment to patients injured, but continues for weeks to treat the patient, until some septic condition happens, and then she will turn the patient over to some privileged physician, whom the nurse likes or thinks perhaps the best man. It seems to me that our Massachusetts Medical Society, of which I have been a member for 18 years pretty near, ought to take means to protect its members and all of the worthy practising physicians. I hope this communication from me will be discussed, and some investigation made throughout the state. It is hard for a poor country doctor, who works day and night for a small pittance, to take up himself a thing of this kind; but a society like ours ought to be bound to take it up. I can prove what I assert right here in Southbridge, where in the American Optical Co., they have, and have had nurses who do more work in the surgical line than four-fifths of the physicians of this town. A few physicians, and I am not jealous of them, because I have as much as I want to do, are called once in a while, when amputation or serious major operations are required. Outside of that, everything is done by the nurse. I know of a case where a man employed by the American Optical Co., cut his finger in his own cellar and went to the nurse for treatment, until she was afraid of a septic condition and recommended some physician, but he came to me. These conditions, gentlemen, ought to be considered by our good and worthy society, and some quiet investigation made, and then some action be taken with the State Board of Registration. Hoping these few remarks will bring some results, I am, gentlemen,

Yours very truly,

JOSEPH G. E. PAGE, M.D.

TOO MUCH ASEPSIS.

CENTRAL FALLS, R. I., April 14, 1916.

Mr. Editor:—Apropos of the recent paper in your JOURNAL on "Too Many Caesarians," I am led to inquire whether there is not such a thing as too much asepsis in obstetrical practice. I am certainly coming rapidly to this belief.

During my internship in one of our metropolitan lying-in hospitals, and since going into private practice, I have been comparing the results of practically perfect asepsis with those in cases where the asepsis has, for some reason or other, been poor.

In my hospital experience I remember that the greatest precautions for asepsis were taken, yet numerous cases ran an elevated temperature afterwards, indicating some grade of infection. Sterile gloves and

gowns, sterile sheets, instruments, bobbin, etc., were used, yet the patients would have temperatures running from 99° to 104°. Many times every chart in the hospital showed an increased temperature, with an elevated pulse; and a good many of the patients had ice-bags over the fundi.

The greatest aseptic care was taken in tying and cutting the cords. Sterile instruments were applied; sterile bobbin used; the hands were sterile; and a sterile bath was given to the baby. In spite of this, there were numerous cases of wet and septic stumps. On the other hand, in the out-patient department, where patients were delivered by externs under all sorts of conditions, where perfect asepsis was an impossibility, in these cases an elevated temperature was unheard of, and a septic cord so rare that the percentage was practically negligible.

I have observed practically the same results in private practice. My practice includes a large number of ignorant foreigners, to whom elaborate preparations for asepsis are extremely alarming. They absolutely refuse to be handled by an obstetrician wearing rubber gloves. A sterile gown reminds them of an autopsy. Cleansing the field of operation makes them angry, as they feel it implies uncleanness on their part. If the physician persists in his preparations, the chances are that he will be discharged, and another called who is not so exacting. Under such conditions, I have seen and had many cases where, through no fault of mine, the asepsis was as bad as it could possibly be. Yet I have been surprised at the uniformly excellent results. In none of these cases have I ever seen a temperature over 99.5° or a pulse over 90. The only asepsis consisted in carefully scrubbing the hands, and sterilizing the instruments. Many of these cases were operative, such as low forceps without ether, or versions without ether, where the patients refused to take an anesthetic or to be scrubbed. Not one of them ran a temperature. In fact, most of the normal cases got up on the second to the fifth day, in spite of advice, warnings or threats. A wet or septic cord in the baby is so rare among these cases that I no longer give them any thought.

Now I should like some explanation for these facts. The only satisfactory answer I can see is that most patients are immune to the effects of their own bacteria. As soon as we go scrubbing, washing and cleaning, we introduce outside bacteria, which take hold and make trouble. The scrubbing process may also make minute lacerations, which enable an outside infection to gain a further foothold.

I am not by any means an advocate of no asepsis in obstetrics. I always use the greatest possible care in cases where I can, but when I see aseptically conducted cases become septic, and non-aseptic cases remain clean, my confidence wavers, and I sort of wonder whether it really is not being overdone.

Very truly yours,

LIONEL L. ALBERT, M.D.

CHANNING HOME.

Boston, Mass., May 1, 1916.

Mr. Editor: Through your correspondence column, may I make known a recent modification in the entrance requirements for female patients at the Channing Home, as follows:

In accordance with a vote of the Board of Directors, it will now be possible to admit a limited number of pulmonary cases for investigation.

This provision is intended to meet the need for an accessible place within a medical centre to which patients of limited means with obscure pulmonary conditions, especially those suspected of having pulmonary tuberculosis, can be sent for a period of observation and study in order, if possible, to establish the diagnosis.

The funds of the Home do not suffice to cover the full cost of maintenance, and a charge of five dollars per week is made for board with an additional charge of about three dollars for x-ray examination when this is necessary.

Physicians may make application for the admission of patients for diagnosis by letter or telephone to the Home. Physicians who send patients to the Home will be notified of the results of the investigation.

Very truly yours,

FREDERICK T. LOBB, M.D.

DRUG PATIENTS IN WESTBORO STATE HOSPITAL.

Westboro, Mass., April 27, 1916.

Mr. Editor: From October 1, 1914, to October 1, 1915, the Westboro State Hospital treated sixty-nine drug patients and fifty-five habitual drunkards. (Our hospital year begins October 1st.) There were forty-three women who had a positive Wassermann among the drug users and twenty-three among the inebriates. More than half of the whole number of women of this type admitted had syphilis in the last few years. Working with them every day I have learned facts not given in their hospital histories, and I feel that the public ought to be warned against a most dangerous evil: for most of these women either worked as waitresses, or came in contact with food served to the public while under treatment for syphilis.

A few cases taken at random:

One woman told me she was employed in the kitchen of one of the Boston hotels at the time she contracted syphilis from a meat cutter. (This man worked in one of the large markets.) Two attractive young women were nurse-girls in the Back Bay while being treated. Another woman was a cook for a well-known family in Salem.

Two women worked in the alteration department of one of our large stores. Still another laughingly told me that she was demonstrating a pure food product over the country.

A clean looking woman of thirty did laundry work in a wealthy physician's home on Beacon Street.

Three good looking narcotics worked in a candy store.

Two girls dispensed soda water at a beach resort, and so on, and so on. Most of these women gave a fictitious name, address, and kind of work they were doing, at the dispensaries where they were treated for syphilis. Even here at this hospital a number were under assumed names.

Don't you think it would be a good idea to have a law passed compelling everyone, who handles food in a public place, to show a clean bill of health before being hired?

Very truly yours,

ALICE S. CUTLER, M.D.

CAESAREAN SECTION AGAIN.

Boston, Mass., April 21, 1916.

Mr. Editor: Dr. Williams' recent rejoinder to my paper on Caesarean Section forces me to ask space for a few defensive comments.

First—Reading my paper through to find what is in it, I am unable to agree that I have taken the position that operative labor has no maternal mortality. I can find nothing in the paper about this, and am ready to accept Dr. Williams' statistics on the subject. Neither did I object to Caesarean Section as an alternative to high operative delivery; I rather approve of it. I simply suggest that an effort be made to determine in advance that high operative delivery will be necessary. One's judgment will sometimes be in error both ways. One's choice of primary Cae-

sarean section or true test of labor in cases with persistent high head, which cannot be put into the pelvis, but overrides little or not at all, will depend on the obstetrician's temperament; either way is honest, fair obstetrics in a primipara. Cases which override definitely will, of course, have Caesarean. I covered these two conditions in my general comment on fair indications under the head of relative pelvic and fetal disproportion.

Second.—Regarding Caesarean for Primiparous Breeches I have never had the pleasure of seeing Dr. Williams' paper in which he shows that a breech presentation usually means lack of accommodation between fetus and pelvic inlet, or uterine cavity, but in view of the fact that it is still a moot point obscured by theoretical discussion what determines even the normal presentation and in view of the fact that many multiparous breeches occur in normal pelves after previous vertex presentations, and that many primiparous breeches occur in which there is no obvious disproportion, and in view of the fact that many primiparous breeches are lost, not for pelvic reasons, but because the cervix dilates badly on the whole, and bags are not used to complete the dilatation, lost in other words by the not fully dilated cervix shutting down on the after-coming head or from one or another cause, not due to bony pelvis, spoken of in my original paper—in view of these facts, I must agree with Dr. Williams in his rejoinder, rather than what seemed to be his opinion in his original paper, i.e. that "one should try to determine in advance of labor which of the primiparous breech cases are going to fall within the 10% in which the baby is likely to be lost, and perform Caesarean section." This was exactly my contention; not that Caesarean section should be performed for primiparous breech cases as routine unless the baby is obviously small.

Third.—With regard to one Caesarean necessitating another: (1) I am unhappy to have to state that I have always been unable, try as I would, to see what bearing experimental work on *cats' uteri* had on the *uteri* of pregnant women who had been subjected to Caesarean. (2) It has been shown by clinical experience that one cannot tell what goes on under a belly wall after it is closed tight. The uterus is a contractile organ; it is possible for a stitch to split out without sepsis. It is also possible for stitch abscess to occur without more general symptoms than are attributed to "absorbing blood clot," or low grade intra-uterine sepsis, or low grade puerperal tube infection—either gonorrheal or not. (3) Good opinion based on clinical experience is overwhelmingly against Dr. Williams in this matter. (4) Because individual cases get by with delivery from below after Caesarean is less than no argument. Very many will get by, but occasionally one will rupture.

Fourth.—If a woman has lacerations from below most of them are capable of repair by not difficult surgery. If she has trouble in the abdomen following Caesarean, surgery is usually useless, oftentimes harmful.

Fifth.—I do not think much of pubiotomy in infected cases either, but as an alternative for craniotomy on the living child I consider it safer within its limitations than Caesarean. If one is bound to have sepsis, it pays to keep it in the pelvis and out of the abdomen; while Porro-Caesarean on a patient in shock from long labor is a formidable proposition. Each, of course, has its place. Simple Caesarean on a septic case has no place at all.

Finally.—The subject of intracranial hemorrhage is not yet a clear one; it occurs in normal deliveries and easy low forceps as well as in difficult high deliveries. Having ruled out high forceps in favor of Caesarean under head of relative pelvic and fetal disproportions in my paper, as above pointed out, I fail to see the point of this comment here.

In conclusion it seems to me Dr. Williams has missed the whole point of my paper; it is a plea for

Caesarean section in its place as well as against its indiscriminate use; it does ask for individualization of cases, more individualization along rational lines than reported series of cases show is being given. But above all it remains a protest against the idea illustrated by the happy young woman who has had one live forceps baby who announces cheerfully at four months, "Oh, I'm going to have a surgeon this time for my baby, and no pain; I'm going to have a Caesarean."

Very respectfully yours,

FOSTER KELLOGG, M.D.

SOCIETY NOTICE.

NEW HAMPSHIRE MEDICAL SOCIETY.—The one hundred and twenty-fifth annual meeting of the New Hampshire Medical Society will be held at Concord, N. H., on Tuesday, May 16. The House of Delegates will meet the previous evening at the Eagle Hotel, Concord.

The meeting will open at 10 o'clock. At 11 o'clock the section on medicine and the section on surgery will meet simultaneously for the presentation of the program. Dr. Phillip H. Greeley is chairman of the section on medicine, and the program will be as follows:

"Diphtheria with Observations on a Recent Epidemic," by Dr. Arthur V. Doud, Bristol; "The Relations of the General Practitioner to the State Hospital," by Dr. Charles H. Dolloff, Concord; "Medical Registration—Its Progress and Its Prospects," by Dr. Walter T. Crosby, Manchester. Secretary N. H. State Medical Board; "The Modern Tonsillectomy," by Dr. Edward R. B. McGee, Berlin.

The section on surgery, of which Dr. Ferdinand A. Stillings is chairman, will present the following papers:

"Colica Mucosa," by Dr. John G. W. Knowlton; "The Operative Treatment of Fractures," by Dr. Percy Bartlett; "The Co-Efficient of Safety in Surgical Operations," by Dr. Herbert L. Smith, and "Brain Tumors," by Dr. Freeman A. Tower. A general session will be held at 2 o'clock at which the following papers will be read.

"Peri-Rectal Suppuration and Sequelae," by Dr. Ralph W. Jackson, Fall River, Mass.; "The Treatment of Un-United Fractures," by Dr. Edward Hall Nichols, Boston; "Obstetric Advances Including Anæsthesia—The Use and Abuse of Pituitrin—Extra-Peritoneal Caesarean Section—Pubiotomy and the Significance of Funnel Pelves," by Dr. John Osborn Polak, Brooklyn, N. Y.; "Pneumonia in Children," by Dr. John Lovett Morse, Boston.

RECENT DEATHS.

DR. WILLIAM STANFORD STEVENS died at his home in Boston, April 29, aged 56. He was a graduate of Harvard College in the class of 1880, and of the Harvard Medical School in 1883. He was at one time a member of the Legislature and of the Boston Common Council. In 1895 he moved to St. Albans, Vt., returning to Boston in 1913. Of late years he had devoted himself to business affairs. He is survived by his widow and two sons. He was a Fellow of The Massachusetts Medical Society.

DR. JOHN EARLE KENNEY, a Fellow of The Massachusetts Medical Society, died at his home in Chelsea, Mass., May 3, aged 54 years. He was a graduate of the University of Vermont College of Medicine in 1882, and joined The Massachusetts Medical Society in 1884, from Winchendon. He moved to Keene, N. H., in 1896, and had practised in Chelsea for the last fourteen years.

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Address.

HOW THE STATE PROVIDES FOR ITS MENTALLY ILL.*

BY L. VERNON BRIGGS, M.D., BOSTON.

Secretary, Massachusetts State Board of Insanity.

THE earliest mention of the care of the mentally ill in this State which I have seen is a quotation from the will of Thomas Hancock, who died in 1764. This, and quotations from Charles Dickens, who visited America in 1842, are made use of in a most interesting paper on the "State Care of Boston's Insane," by Dr. Henry P. Frost, the present able superintendent of the Boston State Hospital. Thomas Hancock in his will (which is dated March 5, 1763) says:

"I give unto the Town of Boston the sum of six hundred pounds, lawful money, towards erecting and finishing a convenient House for the reception and more comfortable keeping of such unhappy persons as it shall please God, in His providence, to deprive of their reason, in any part of this Province; such as are inhabitants of Boston always to have the preference. This sum I order shall be paid into the hands of the Town Treasurer for the time being, viz: One-half thereof in three months after said House shall be begun, and the other half

thereof when the same shall be finished and fit for said purpose. And in case said House shall not be built and finished in three years after my decease, I then declare this legacy to be void; or if I should in my lifetime erect it, this bequest then to be void."

Thomas Hancock was an uncle of John Hancock, afterwards the first Governor of Massachusetts. It was Thomas Hancock who built the house which was inherited by his nephew, Governor John Hancock, which became the Governor's Mansion, next to the State House on Beacon Hill.

The above legacy, given to the City of Boston by Mr. Hancock, was declined because the Selectmen did not consider that there were enough mentally ill persons in the Province for whom to erect such a house, and it was not for 75 years, or in 1839, that there was opened, for the reception of patients, the Boston Lunatic Hospital, built because of the over-crowded condition of the Worcester Lunatic Asylum (now the Worcester State Hospital), which was opened in 1833.

Prior to that time, McLean Hospital (then in Somerville) received patients. This hospital was opened for the reception of patients in 1818. Taunton Hospital was opened for the reception of patients in 1854; Northampton State Hospital in 1858; Grafton State Hospital (formerly Worcester State Asylum) in 1877; Danvers State Hospital in 1878; Westborough State Hospital in 1886; Foxborough State Hospital in 1893; Medfield State Hospital in 1896; Monson State Hospital in 1898, and the Gardner State

* Delivered at the Department of Clinical Research, Massachusetts Medical Society, Boston, May 15, 1916.

Colony in 1902. The Mental Wards at the State Infirmiry were opened in 1866, and the Bridgewater State Hospital (for the criminal insane) was opened in 1886. The first school for the feeble-minded was opened at Waltham in 1848, and a second school at Wrentham in 1907.

According to a census taken in 1865, there were approximately 2,104 so-called insane and feeble-minded in a total population of 1,267,031, or 1 to 602. Today, with an estimated population of 3,693,310, we have 18,604 so-called insane, feeble-minded, epileptics and alcoholics in institutions under the care of the State Board of Insanity, or 1 to 198.

The mentally ill in this and most of the other States of the Union are today under State supervision. In Massachusetts the average annual expenditure for their care and treatment, for a five-year period, including both maintenance and expenditures for special purposes, is \$4,068,455.00, the largest single item in the State's budget.

It therefore behooves every citizen, for reasons of economy, as well as humanity, to know how this important branch of the State's work is being carried on. We have in Massachusetts 10 State Hospitals for the mentally ill, two schools for the feeble-minded and a school for the epileptics; also 27 private hospitals or sanitariums.

Each of the State Hospitals is designed to cover a certain district, and it will not be necessary to send the mentally afflicted patients where they cannot be visited frequently by their families and friends, when the State properly provides for all its wards.

These institutions are under the control of a central Board of Insanity, of which the present speaker has the honor to be the Secretary. For many years this Board consisted of five unpaid members, whose powers were mainly recommendatory or advisory. They met monthly, the actual work being done by a paid Executive Secretary. In 1914, the Board was reorganized by act of Legislature, following investigation by the Commission on Economy and Efficiency, in which it was proved that there was really no central authority upon whom to fix responsibility.

The new Board, as at present organized, consists of three paid members, giving full time, one of whom must be a specialist in mental diseases. The Board now has mandatory powers and greatly increased responsibility, and consequently its opportunities for usefulness have been greatly increased.

Among the things which this Board has accomplished during its short term of office, which I will mention briefly, are:

The issuing of Bulletins monthly, informing the different State Hospitals and the public what is being done in the hospitals and by this Board.

Raising the standards of requirements for physicians on the staffs of the State hospitals.

Stimulating the establishment of out-patient departments for the mentally ill.

Stimulating the discharge of patients who could be taken care of as well outside the institutions as in.

Re-classifying the patients in the institutions, segregating the inebriates, the epileptics, the feeble-minded and the delinquents into groups by themselves.

Investigating the mental condition of prisoners at the Bridgewater State Hospital and at the State Prison, to ascertain which of the prisoners are really responsible for the crimes which they have committed, and which are not.

Classifying the medical officers of the State institutions according to salaries paid, thus making the positions in the different hospitals uniform.

Encouraging the opening up of the hospitals to the friends and relatives of patients, and to visitors.

Purchasing the land for a new Metropolitan State Hospital, and also for a new school for the feeble-minded in the western part of the State, and making plans for the new Metropolitan State Hospital.

Formulating rules and regulations for the government of the hospitals.

Making plans for a uniform curriculum, and raising the standards of the training schools for nurses in all the hospitals.

Controlling the use and abuse of drugs and alcohol in the State institutions.

Increasing the scientific work, which also has reduced the number of accidents and injuries, and done much toward ascertaining the cause of mental disease.

Establishing fire drills in all the hospitals, and requiring monthly reports of the same.

Changing some of the asylums into State hospitals.

Formulating many other progressive measures, which there has not yet been time to work out or establish.

Today there is an over-crowding in our State hospitals of 807, and no relief is in sight for the next two years. The Legislature of Massachusetts has not appropriated any money for additional beds in the past two years. There is a bill before the Legislature now asking an appropriation of a million dollars for the erection of the new Metropolitan State Hospital, to be built on land which this Board purchased last year. There are committed patients today belonging in the Metropolitan District to the number of 6,000. Of this large number, only 1,609, or 26% are taken care of in the Metropolitan District. The others belonging in this district are sent to different hospitals, where in many instances their families cannot visit them. This also leads to an over-crowding in these hospitals, most of which would otherwise be able to take

care of the mentally ill of their own districts without additional buildings.

It is planned that the Boston State Hospital shall accommodate 2,000 patients. There are plans for 2,000 more at the Metropolitan State Hospital, and the architects' plans for buildings for the same are now before the Legislature. It is hoped that the Legislature will appropriate the money to commence work on this new institution this year.

Coming down to just how Massachusetts takes care of its mentally ill: There are three ways in which patients may be admitted to our State hospitals.

1. The people in the community who feel that they need hospital care because they are conscious of some mental disturbance, and who are perfectly capable of deciding where they will go, may go voluntarily to the hospitals, and are classed as "Voluntary" patients. Four years ago we had 359 voluntary admissions in our State hospitals; during the past year we have had 963. These patients come to us usually in the very early stages of their trouble and receive treatment which, in a majority of cases, enables them to leave the hospital without commitment and without actually losing their reason. This increase shows the greater confidence the public has had in our institutions in the past few years.

2. The next class of cases is termed "Temporary Care" cases, which, under Chapter 307, of the Acts of 1910, and Chapter 174 of the Acts of 1915, may be sent to any of the State hospitals for an observation period to determine if there is some obscure mental disturbance due to disease, accident or injury, drugs or alcohol, or a psychic disturbance. In the Boston district these cases go to the Psychopathic Hospital, which has special facilities for temporary care and for acute cases. Last year, 1,529 such cases were received at the Psychopathic Hospital. These patients may be sent by any physician, preferably the family physician, or by the police, without commitment. The class of patients who are usually received from the police are those who are found on the street, in hotels or in boarding houses, who suddenly become confused, apprehensive or, in some cases, violent, and who, prior to the enactment of this law, were taken by the police to the station house, where, if the officers felt there was some mental trouble or delirium, an order was made for their removal to the Tombs. Here they were locked up, sometimes in cells without even a mattress, and examined by two physicians who the next day appeared before the Judge (if the Court happened to be sitting). Otherwise the patient might have to remain in the cell in the Tombs over Saturday and Sunday (and a holiday occasionally) before receiving expert medical care. It was a crime to take these people and shut them up in cells. It is now against the law, and the police, who have always felt

opposed to these brutal methods, now take these persons directly to the Psychopathic Hospital, where they are received, bathed and put to bed, nursed and given proper medical care and treatment, as are cases in general hospitals. This new law applies all over the State, and these 10-day "Temporary Care" cases may be taken into any State Hospital under the same conditions.

3. The third class of admissions are those whose family physicians, or other physicians who may be called, find that the patients are so disturbed mentally that there is no question but that they should be committed to a hospital, for a time at least. These cases have each to be examined by two physicians, who appear promptly before the judge of the court, and the latter gives an order to some court officer to take the patient to the hospital to which he has legally committed him.

The State Board of Insanity now has a bill in the Legislature asking that a law be passed which will result in the State Hospitals sending trained nurses and attendants for these patients, instead of having them taken to the hospitals by the police or court officers. This is no reflection on the manner in which most of these patients are handled by the police, but the principle is wrong: that a person having mental disease should be handled by officers of the law, while, if he is suffering from any other disease, ambulances and nurses are sent for him and he is treated as an ill person and not as a criminal. New York has such a law, as well as Rhode Island and North Carolina, and it is hoped that Massachusetts will soon be ready to care for her mentally ill people as she does for all other cases of illness.

Nine of our State hospitals have training schools for nurses. It has been difficult to get enough nurses of the right sort to take the training, and many of our institutions have to depend largely upon trained or untrained attendants, both men and women. With the introduction and standardizing of a new curriculum for nurses, it is hoped that the qualifications demanded will be so high that this training course will attract a class of women of ability, who shall become experts in their work. We hope soon to have in each State hospital a three-year course, including nine months in a general hospital, and also including instruction in therapeutic occupation, hydrotherapy, etc., as well as much special instruction in the care and treatment of the insane. In addition, it is proposed to have a post-graduate course at the Psychopathic Hospital, which we trust will be largely attended by nurses from our own and other high grade training schools who desire to fit themselves for supervisory and teaching positions in the various State Hospitals.

The present Board is also encouraging the employment of female nurses in place of male attendants on all of the wards of the State hos-

pitals, both male and female. Where this has been done, improvement has followed, both in the condition of patients and the condition of the wards. Several of our State hospitals have started this work and many hospitals in this country now have only women nurses in charge of the male wards. Even in Oklahoma, according to the last report of the Oklahoma State Hospital at Norman, "women nurses have been employed in male wards in this hospital for the last four years. In not a single instance in these years has a male patient struck his nurse. Men rarely are so disturbed that they will not yield to the gentleness of women. The presence and ministrations of women nurses in male wards have been observed as possessing even clinical merit, as several classes of psychoses seem to respond more quickly to nursing by women than by men."

The out-patient service of the State hospitals has been stimulated by this Board, so that now the State hospitals have reached out into the community to give relief to the early case and prevent the progress of mental disease and to obviate the necessity of hospital residence. This out-patient service has grown month by month, and now out-patient clinics are established in the following cities:

Worcester, Spencer, Taunton, Fall River, New Bedford, Northampton, Springfield, Greenfield, Pittsfield, Boston, Danvers, Lawrence, Gloucester, Haverhill, Lynn, Salem, Newburyport, Malden, Westboro, Gardner, Fitchburg, Winchendon, Monson, Brockton, and Grafton. The Massachusetts School for the Feeble-Minded has also reached out into the community and has clinics in conjunction with these State Hospital clinics at Worcester, New Bedford, Fall River, Taunton, Haverhill and Springfield.

The last three months' report shows that 82 patients came or were sent to these clinics by physicians, 11.15% of whom were never in a State Hospital and are, therefore, the early cases in which preventive measures are so valuable.

There is no reason why clinics should not be established in every city or town of any considerable size where, as is now the case in the present clinics, people in the community who feel they need help on account of some mental disturbance can go, or where the city or the country physician, who has had no special training in mental disease, may send or take his patient for consultation, without charge; where the charity worker or town officer, or other public official may take or send children or adults for examination; where the school committee or school teacher or nurse may take pupils who are backward and whose retardation cannot be explained; and where the friends or members of the families of the patients in the hospitals, who are unable to go to the hospitals to see their friends or relatives, may come and see the physician who is directly in charge of that particu-

lar member of their family or of their friends and talk with that physician and get the latest reports concerning the ones in whom they are interested. This has been a great satisfaction to those who are unable to go to the hospitals, and of value to the hospitals, in that much can be learned of the family history and the normal tendencies of the patient from the members of the family visiting the clinic, thus helping the treatment.

At each of these clinics, beside the physicians, there is a social worker, who obtains histories of the families and records what their previous surroundings and normal conditions were, and in many cases facts which led up to the mental illness, which could be obtained in no other way. This social service is being developed as fast as the Legislature will give the money for its development, and the Board has urged the appointment of a Director of Social Work to help the hospitals organize and amplify this work.

In regard to treatment: There is a general impression that nothing is done in the way of treatment for the mentally ill in our State institutions, and that patients receive only board and lodging. This is, in some cases, true, and is due to several factors:

First, we may say, lack of funds to properly extend medical and surgical aid to these people.

Second, lack of funds to employ physicians skilled in the treatment of mental disease, and to retain them after we have been successful in securing them. In no branch of the profession has there been such a field as this for untrained and unskilled physicians.

This present Board of Insanity has set about to raise the standard of the medical men who hereafter shall come in contact with the State's mentally ill, and all physicians who have not had previous experience in the care and treatment of mental disease are obliged to take a special course at the Psychopathic Hospital. That the poor man, as well as the rich, may enter into this field of medicine, the Board has arranged with the Psychopathic Hospital to give this course free of charge to all candidates for State hospital positions, and during the course they receive board and room free.

The young men who are now coming into the service should be of great help to the superintendents, whose training and experience merit the best of assistants, and with good tools better work is sure to be done, as, for instance, the work which is now being done by the Board's Special Investigator of Brain Syphilis. This physician visits all the hospitals, and is introducing modern treatment in brain syphilis, including many cases of general paralysis, which until recently was supposed to be an incurable disease. Some most encouraging results have been obtained, but it is too early to publish statistics. The Board has increased the work of the Pathological Department, appointing additional physicians skilled in the study of dis-

ease, and the results of this work are most encouraging.

The giving up of restraint in the hospitals has increased the use of the continuous bath, so that now excited patients, instead of being restrained mechanically, as was formerly the custom, are allowed to get in and out of the tubs of water, and to lie in the bath, where they soon feel the beneficial effects of the water. They often ask to be allowed to lie in these tubs, and frequently patients remain in the baths for many hours of the day or night.

Occupation is more and more a feature in a therapeutic and curative way, and teachers are being employed to instruct many patients in arts and crafts and industrial work, so that, instead of sitting on benches and around the dormitories and wards day after day, doing nothing, they are interested in some occupation, which will also interest their neighbors, and instead of becoming quarrelsome and getting tired and cross with nothing to do, today in the ward where the patients are occupied—in knitting, basketry, bead-work, lace-making, pottery-work, or playing games—the whole atmosphere of the ward is changed from one of depression to one of more or less cheerfulness. These teachers are also instructing the nurses, and the Board has in mind the purpose of this instruction, which is that the nurses shall become teachers and helpers to the patients, rather than keepers and overseers.

This Board found epileptics, insane, alcoholics, feeble-minded and defective delinquents associating more or less in the same hospitals, and some of these classes in the same wards. It found feeble-minded and defective girls as young as 15 or 16 years of age in wards with the insane adults. One of the first things we did was to plan a re-classification of patients, and we have now accomplished the removal of virtually all the epileptics to two hospitals, with the idea of giving them special treatment as soon as the money can be obtained.

We have also removed from the hospitals to one ward of one hospital all the women inebriates. This is the first classification of women alcoholics, and the first segregation of them that has ever been made by the State of Massachusetts.

The Board found that many of the relatives and friends of the patients could not see the patients in whom they were interested, because the visiting days were not convenient, without loss of time and possibly loss of position if they made frequent visits. They may now visit the State Hospital every day in the week, and may see their relatives and friends when it is not a sacrifice to do so. This hospitality will do much, we trust, to disarm ignorant public criticism. We want the public to know our institutions and the effort they are making to do intelligent, humane, scientific work for this much-neglected class of the State's wards. Not until we have

public sympathy can we expect the Legislature to grant us the necessary appropriations to carry on this work efficiently.

The paroling and allowing patients' visits has been encouraged and is increasing. Under our laws a superintendent may allow a patient to go out of the hospital on six months' leave of absence for trial, to be returned at any time within the six months if it is found that he is not ready to take up his life in the community. No one should ask that this privilege be granted unless the superintendent feels confident that it is for the best good of the patient. It too often happens that the friends desire the patient out of the hospital before the time comes when it is best that he should go. On the other hand, it is only too common to find sons and daughters anxious to shift the care of harmless, senile parents upon the State, who might much better be cared for in their homes.

Accommodations are being prepared in one of the hospitals to take care of that class of patients which has been sent to us, called "defective delinquents." These wards of the State ought not to be associated with the mentally ill, but are so defective from birth that they are not tolerated in the community, and if discharged into the community are returned again and again. They must be taken care of by the State, and should be provided for in groups by themselves, where they will not come into contact with the really mentally ill persons, and where the mentally ill will not have to come in contact with them.

The Board also is planning to remove the feeble-minded from the State hospitals, and is now picking out a great many of these cases from certain wards of the hospitals and placing them by themselves in a closer and better classification.

As soon as the new Metropolitan State Hospital is built, or there is room for more patients in the extensions of any of the other State hospitals, the Board will remove many cases from the Bridgewater State Hospital (for the criminal insane) who can be taken care of in our State hospitals. There are many patients in this hospital who are not really criminals. Nearly 25% are feeble-minded, and many are defective delinquents and should always be looked after. On investigation, the Board found 16 cases there who were never criminals, and who had no criminal record. Some of these patients had been taken to Bridgewater from other institutions to help in the work, until they got enough criminally insane there to perform the necessary ward duties. These were apparently forgotten until the present State Board of Insanity was appointed and made its investigation.

This Board has extended its work, at the request of the Prison Commission, to the inmates of the State Prison, and has had examinations made of 300 prisoners. The result shows that

22% of these men cannot be held responsible for the crimes which they have committed. They are feeble-minded, even to the point, in some cases, of being imbeciles, and to turn them again loose into the community to associate with the depraved class that lead them into trouble, is a crime for which Massachusetts ought not to assume the responsibility.

The present Board is encouraging more out-of-door life and more open wards. There are in some of our State hospitals wards and buildings which are not locked, neither the doors nor the windows—and the patients come and go as they please. There should be more of this. A majority of the people now confined in our State hospitals should be allowed the freedom of the grounds without the slightest fear of their running away or doing harm to themselves or others. Only about 8% are really violent and dangerous. Our superintendents, who have appreciated this fact, are today encouraging out-of-door sports and games and work.

One of the results is the formation of baseball nines in the different hospitals, and now there is an interchange of games between the nines of some of the hospitals. The nine of one hospital visits another hospital and plays one afternoon, and later on the latter nine returns the visit and plays the first hospital's nine. This interchange between teams is going to be more frequent, and brings much interest to the patients who can watch these games. At one of the last games of the autumn, 50 patients of the Medfield State Hospital were allowed to accompany the baseball nine to Taunton the afternoon that Medfield played Taunton. This, and the privilege of attending the dances in the evening, and private theatricals and moving picture shows, are great incentives to patients to get hold of themselves, to control themselves, and to coöperate with the physicians in the work of getting them back into the community.

Original Articles.

HALLUX RIGIDUS.

BY CHARLES F. PAINTER, M.D., F.A.C.S., BOSTON.

IN A paper recently published by the writer, upon Hallux Valgus, reference was made to the possible influence of anatomic variations of the bones of the tarsus upon the causation of that deformity. My belief that such might be the case was derived from studies that were made some years ago concerning the matter. There are a number of anatomic variations in the bones of the tarsus, as has been pointed out by the late Prof. Thomas Dwight of the anatomical department of Harvard. At the Harvard Medical School there are now a large number of radiograms of dissected feet, prepared under Dr.

Dwight's direction. They were practically all adults and sufficient data was available in reference to them for the purposes of this discussion.

The theory which had been suggested to me from the clinical observation of a number of cases of hallux rigidus was this: anatomical variations in the size or conformation of the bones of the tarsus seems the only reasonable explanation for the fact that the great toes of certain individuals gradually acquire incapacity for dorsiflexion when these individuals have experienced no traumatism and are not the subject of any arthritic diathesis. Furthermore, in practically every instance, these patients are so shod that the metatarso-phalangeal joints of the first toes are situated immediately beneath the points of juncture of the vamps with the uppers. Sometimes in the same patient this will be true on one foot, whereas the other will show no tendency to rigidity of the toe and at this joint the juncture of the vamp and the upper will not be related, as they are on the side of the rigid toe. Inasmuch as hallux rigidus is caused by an hypertrophy of the bone on the dorsum of the distal end of the first metatarsal, it would seem that under the conditions present when the seam of a shoe presses continuously against this point while the foot is in action, and the "break" in the shoe, which necessarily comes opposite the point of flexure of the foot, will increase this pressure, the factors needful to produce such an hypertrophy as that which characterizes hallux rigidus are all present.

Long before these patients have any idea of the beginning rigidity of their great toe joints they often have had the skin rub off on the top of this joint while "breaking" in new shoes, and they are obliged to exercise great care in getting their feet fitted to shoes. More often than not this difficulty will occur with only one foot. Sometimes, I presume, where the patient feels that he can afford it and these difficulties arise in purchasing ready made shoes, he resorts to the custom-made shoe and, if he does so sufficiently early, possibly saves himself from any noticeable rigidity.

If, as I shall try to show, the anatomic variations in the lengths of the various tarsal bones are the cause of hallux rigidus, the question naturally arises, why do these not occur more often in women in whom these same variations must occur. I think the answer to this must be that the stock out of which men's shoes are made is so much heavier than that from which women's shoes are made that it offers more chance for traumatism. In addition to this, men use their feet more and harder than women, as a rule.

In looking over the series of radiograms which Prof. Dwight has taken of the bones of the feet, which I was permitted to see through the courtesy of the anatomical department at Harvard, there was seen by actual measurement to be variations in the comparative lengths of the bones of the feet, possessed of the same total length, amounting in

many cases to as much as 3.8 in., though the average variations were probably not more than 1/4 in. These variations were most notable in the lengths of the metatarsals. Furthermore, this difference was frequently observed between the two feet of the same individual, thus accounting for the fact that hallux rigidus is very often a unilateral deformity. Sometimes the phalanges showed the variation; rarely was it observed in the bones of the posterior tarsus.

If there are these differences in the lengths of the metatarsals and phalanges in persons who have feet of the total length, breadth and thickness that would make their feet conform to certain sizes of ready-made shoes, it is obvious that the "breaks" in the shoe cannot come at the points where they would come under ordinary circumstances if either the metatarsals or the phalanges have departed to any degree, however slight, from the usual. It is at once apparent that a difference of a quarter-inch in the length of the first metatarsal would make the metatarsophalangeal joint come at a different place in the shoe, and when the shoe had been worn long enough to have the "break" develop in the leather at that point of flexure, it will be seen that it comes close up to the juncture of the vamp with the upper. When this occurs at this place the stock is stiffer because it is near a seam where there are two thicknesses of leather stitched together with a double layer of lining. When the person comes up on his toes under such circumstances there is much more material to be crowded down against the joint, and the effect is multiplied by the number of steps the person takes. The osteoblastic cells in the area thus irritated proliferate, forming a bony overgrowth in this region, which mechanically obstructs the dorsal movement of the phalanx upon the metatarsal, and this, in turn, keeps the joint in a state of chronic irritability and spasm. Not being able to bend at the mediotarsal joint in a dorsal direction, this motion must be secured elsewhere and it is obtained at the first phalangeal articulation of the great toe. The evidence of this is seen in the hypermobility of this joint, and from the fact that the shoe usually shows a small round hole worn immediately beneath this articulation in the sole, for now the pressure in walking is brought under this joint instead of beneath the metatarsophalangeal articulation. There is generally a ridge on the dorsum of the shoe over the metatarsophalangeal joint, indicating where this articulation is thickened. If the deformity is unilateral, as is frequently the case, a comparison of the two shoes brings out these two points very quickly. It will almost always be noted that this ridge on the dorsum of the metatarsophalangeal articulation comes directly beneath or almost directly beneath the point where the seam marking the juncture of the vamp with the upper lies. It may happen, of course, that the particular pair of shoes the examiner sees on the patient may not show this, but further inquiry and examination may reveal

it in other shoes that the patient wears or has previously worn. It is not uncommon for the patient who suffers from this deformity to have a small shoe store in his possession, which represents his attempt to find relief in shoes for the troubles he has. As has been pointed out before, he has often had a good deal of trouble in getting shod, for the reason that a new shoe chafes the dorsal surface of the distal end of the metatarsal, and in breaking in a new shoe the skin is often abraded over this joint.

In the management of this condition several lines of treatment are open for consideration. The conservative treatment consists of custom-made shoes, so constructed as to give no pressure over the metatarsophalangeal joint, together with a plate fashioned after the manner of the ordinary flat-foot support, supplemented by a steel tongue, the width of the great toe on its plantar surface and nearly as long as the toe, which projects from the front of the plate and is, in fact, a part of it. This prevents any attempt at motion in dorsi-flexion at the mediotarsal joint, and therefore stops irritation of the cartilage and its consequent proliferation. The use of the plate will be unnecessary after five or six months, and the patient will generally find himself comfortable, and, with custom-made shoes, may expect to get on without further difficulty. This line of treatment is applicable to the earlier cases before dorsi-flexion is much restricted.

The more abnormal cases, where there is no dorsi-flexion, possibly require more radical treatment. This means operation. The ridge on the dorsum of the metatarsal is chiselled away or a regular Hüter operation is performed. In cases where there is ground to suspect any osteoarthritic diathesis the latter is preferable. An English orthopedic surgeon has excised the sesamoids beneath this joint for the relief of these symptoms with very gratifying results, it is stated, but just what surgical indication is met by such a procedure it is difficult to see.

The following cases are reported as indicating the results of treatment, operative and otherwise, and the pathological changes found.

CASE 1. Female, age 40 years. Complains of pain in the right great toe on any great exertion, particularly while playing golf or tennis or dancing. Shoeing was also becoming more and more difficult on account of pressure of the shoe on the dorsum of the first great toe. On examination there was inability to dorsi-flex the great toe on the right foot whereas on the left it could be dorsi-flexed a few degrees, though not normally. Flexion is also partly restricted. On palpation there is a ridge on the distal end of the first metatarsal, which is tender to pressure and squares the end of the metatarsal so that the phalanx cannot ride upon the metatarsal, as it can when the former is normally shaped. The shoes show the failure of the phalanx to bend upon the metatarsal by wearing beneath the joint between the first and second phalanges instead of on the ball of the shoe. The trouble had been devel-

oping for a year or more and there was no sign of arthritis in any other joints.

Under ether the capsule of the metatarso-phalangeal joint was exposed through an incision just to the outer side of the tendon of the extensor longus hallucis and about two inches in length. The tendon was pushed aside by blunt dissection and the capsule of the joint was incised by a cut at right angles to the skin incision and just at the base of the bony ridge on the metatarsal. This revealed a ridge of cartilage all across the end of the metatarsal, which stood up 3/16 in. above the level of the shaft and was soft enough to be removed with a chisel without the expenditure of much of any force. The removal of this permitted an increase in the motion of the toe in dorsi-flexion.

It was fully six months after the operation before the joint became non-sensitive and before the patient could enjoy the use of the foot at games or in dancing. Now, nearly a year and a half after the operation, there is practically no discomfort in use of the foot in any way or upon any motion, and dorsi-flexion is nearly, though not quite, normal. It was not possible in this case to recognize, on inspection, any anomalous development of the component parts of the tarsus or metatarsus.

CASE 2. Male, aged 45 years. Has always been a rather athletic individual, playing golf and tennis principally. As he grows older has noted more and more a tendency for the joints of the great toes to sprain on use, particularly when he engages in the games above mentioned. Also it becomes more difficult to shoe himself comfortably. On physical examination the toes seem rather short and the metatarsal appears rather long as compared with the total length of the foot. There is a noticeable ridge on the dorsal surface of the distal end of the metatarsal, and this causes in the shoes, after they have been worn a while, a notable prominence, which comes closely beneath the juncture of the vamp and the upper. On palpation this ridge is very conspicuous and is tender to pressure.

Careful attention to the shoeing makes the condition more comfortable, but still exertion causes considerable discomfort. There are no signs of arthritis in any of the other joints. A few of the terminal phalanges show the effects of playing baseball, in an enlargement of these articulations.

At operation, incisions similar to those made in Case 1 show a cartilaginous ridge projecting upward and backward from the articular end of the metatarsal. This stood away from the shaft of the metatarsal to such an extent that the blade of a blunt dissector could be passed beneath this ridge on its free edge to the extent of 3/8 in. before it touched the base of the ridge from which this lip projected, and the dorsi-flexion was increased about 15° by cutting away this overgrowth. Both great toes were held in extreme dorsi-flexion by plaster casts. Plantar flexion of the great toes was also restricted to a considerable extent. At the end of three weeks the patient was able to be about without discomfort, and two weeks later was wearing a shoe carefully chosen so as not to cause any pressure over the first metatarso-phalangeal joints.

CASE 3. Male, aged 55 years. For many years the patient had been troubled with pain over the first

metatarsal joints when getting accustomed to new shoes. Gradually he became aware of the thickening over these articulations, and when first seen professionally because of this there was not only a marked thickening in this region and inability to dorsi-flex at this joint, but hyperflexion at the first phalangeal joints also. On account of the presence of a well-marked osteoarthritic tendency in other small articulations and a high grade arteriosclerosis, conservative treatment was advised. To carry this out, he wore for some time, with a good deal of relief, one of the "tongue" plates above described. These are likely to break unless tempered very carefully, and he became disgusted with them after a while because of this tendency, and gave them up. While he used them he was a great deal more comfortable, and when he decided to abandon them he resorted to custom-made shoes.

This condition, though not perhaps so common as hallux valgus, is quite as annoying. An early recognition of the indications of its existence, which may be suspected when the skin over the dorsal surface of the first metatarso-phalangeal joint is habitually irritated while breaking in new shoes, will usually enable one to so shoe himself as to check the development of more trouble. One result of the development of this rigidity is alteration in the ends of the metatarsals. This is in the nature of squaring the articular surface, which has the effect of limiting dorsi-flexion. Where this is the case, excision of the ridge on the dorsum will not increase dorsi-flexion very much, and in such cases a regular Hüter operation, as in hallux valgus, is better.

If there is an osteoarthritic tendency present it is best to keep away from surgery altogether.

When operative treatment is employed, the after-treatment is much the same as in hallux valgus and the convalescence is just about as long.

OBSERVATIONS ON THE USE OF THE DUODENAL TUBE FOR DIAGNOSIS AND TREATMENT.*

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(Continued from page 678.)

USE OF THE TUBE IN TREATMENT.

The duodenal tube of Einhorn was found very useful in a limited group of cases. It is not a method of treatment to be used as a routine in any large number of diseases of the stomach or bowel: it is a method for the exceptional case, and its use should be limited strictly to these. In this way we avoid using the tube when a simpler method of treatment would be better, and

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we are able also to obtain brilliant results in suitable cases which do not yield to other methods of treatment.

Many physicians have passed judgment on the tube without ever using it, and have been afraid to try it for fear its discomforts would outweigh its benefits, or because they believed they could get as good results in other ways. The discomforts of the tube are very moderate; it is not difficult or painful to swallow; the presence of the tube in the throat is slightly disagreeable, but makes no real trouble, and after the first few hours the patient gets accustomed to its presence. It is much smaller than the smallest stomach tube; the irritation in the throat is trifling and does not keep the patient awake at night. It has surprised many physicians to see the contented, happy faces of patients who are having duodenal feeding.

The use of the duodenal tube is often the best way to rest the stomach and keep the patient well fed. The skeptic finds this hard to believe, but it is true. I have repeatedly seen the same food taken with perfect comfort through the tube, which caused distress and vomiting when taken by the mouth. It is a safe, sensible method of treatment for a selected group of cases and deserves more general use. We are able to supply abundant food at the point in the digestive tract where it is easily digested and absorbed, and, also, to maintain nitrogenous equilibrium. This is the only form of artificial feeding in which it is possible to keep the balance of nitrogen. This is a marked contrast to rectal feeding, where hardly anything is absorbed except water and sugars, where only about 1-10 the necessary nitrogen can be given, and only about 1-4 the necessary food. With rectal feeding the patients lose weight rather rapidly, as a rule; with duodenal feeding the patients almost always keep their weight, and often make good gains in weight. With rectal feeding we can get in about 500 calories; with duodenal feeding usually 1500 to 2000 or over. The tube is not used more than a week or two, and then, with vomiting stopped and nutrition improved, rest and feeding by mouth follow.

INDICATIONS FOR USE OF THE DUODENAL TUBE.

An important use of the tube is in cases of persistent vomiting, "medical cases" in nervous exhausted persons, including pregnant women, where a reflex or toxic cause has upset the stomach seriously. I have restricted the use of the tube here to the worst cases, which resisted other forms of treatment, and used it as a last resort. Now I use the tube earlier and more often than at first. There were some failures, of course, but more brilliant results. I have not used the tube in "surgical cases" of vomiting, with obstruction, or immediately after operation.

Another important group are cases of severe malnutrition with loss of appetite, and perhaps vomiting, with low, atonic stomachs which are

dilated and unable to empty properly. This indication is not new, but I wish specially to emphasize it, as some of the most striking results have been obtained in this class.

Gastric and duodenal ulcer is another group of importance. Here opinions have differed greatly as to the value of the tube.

Some men have felt that it is the best of all treatment for ulcer, when the tube is well borne; that it should be used in practically all uncomplicated cases; that it saves time and increases the percentage of recovery. It is used on the theory that an ulcer heals better in a well-fed person with an empty stomach than in a starving one, or one whose stomach is doing the work of digestion.

Others use the tube only after a Leube or Lenhartz treatment has failed; others have little or no use for the tube in ulcer, and think that those cases which do not yield to ordinary medical treatment should go directly to the surgeon; that the tube might distinctly harm the patient by causing hypermotility and secretion,—the two very things we wish to avoid in treating ulcer.

It is still a question how often to use the tube in ulcer. I have been quite conservative and used it only in a small group of cases, namely, in those which had resisted other medical treatment and in which no marked deformity or obstruction was present. The presence of hemorrhage, even if considerable, has not proved a counter-indication.

I have also used it in cancer of the esophagus, to relieve and prevent starvation. Here the tube had to be pushed down by means of a stylet over a silk thread guide.

Other less urgent indications have been proposed, such as lavage of the duodenum in duodenal catarrh, gall-stones, chronic jaundice, or cirrhosis of the liver, for the purpose of washing out inflammatory or infectious particles; also for disinfection of the bowel by inflation of oxygen through the tube. I have not felt that the indications were clear for the use of the tube in this group.

THE TECHNIC OF FEEDING.

This has been well described by Einhorn of New York and W. G. Morgan of Washington from their large experience, and their papers should be read. I am especially indebted to Dr. Morgan and Dr. Charles G. Stockton of Buffalo for valuable suggestions. There are many details of technic which must be kept in mind in order to get the best results and make the treatment a success.

We have used the Einhorn tube entirely for treatment, as here the patient is in bed and there is no special need for great speed in introducing the tube, and it is easy to retain for the period of treatment, which often lasts a week or two. It is sometimes desirable to use an extra long tube of 100 to 125 centimeters, which will pass about 25 centimeters beyond the pylorus. This was

used in certain vomiting cases to prevent regurgitation or vomiting of the tube, and in duodenal ulcer it is well, also, to have the tip of the tube well below the ulcer.

Various special syringes have been devised for introducing food through the tube. They are all unnecessary; the simplest apparatus is the best, and consists of a glass reservoir or can, with a hole in the bottom, and a rubber tube provided with a clamp and a glass drop tube, such as is used for the Murphy drop-method of giving fluids by rectum. I first used a thermos bottle as a reservoir, to keep the food at a constant temperature, but found that this was unnecessary. The duodenum is more sensitive to heat than to cold, and the main thing is not to have the food too hot. It should be 98° to 100° F.

The food is given slowly, 50 to 60 drops a minute, so that the feeding takes usually from 20 to 30 minutes. The rate of flow depends upon the patient; some require twice as long as others for a feeding. Patients should be watched at first during the feeding for nausea or discomfort, until a comfortable rate of feeding is found. In this time the food in the reservoir cools only a little, and is easily warmed before reaching the duodenum by passing down the long esophagus. If any additional warmth is required in a cool room, this is easy to arrange by placing a hot-water bag over the tube in bed between the reservoir and the patient. The pressure from the reservoir, hung two or three feet from the patient's head, easily forces the liquid food through the duodenal tube, if the latter is kept clean.

The standard foods for use through the tube are milk, eggs, cane sugar, or milk sugar and cream. It is better to strain the liquids that are used through several thicknesses of gauze. Eggs should be stirred up in the milk, not beaten. Milk sugar often irritates the bowel and has to be used sparingly or omitted. The best way is to begin with milk alone or mixed with egg, and not use the milk sugar until after a week. Eggs are sometimes not borne well; it is often well not to begin to use eggs for four or five days, then one-half of one egg may be added to every other feeding, and, a few days later, to each feeding. Cream may be given, from one to three ounces, every other feeding; broths are not very useful, they have little food value, and may clog the tube.

Eight feedings a day at two-hour intervals are the rule, beginning at 7 a.m., and ending at 9 p.m., starting with two or three ounces and increasing to six or eight ounces on the second day and eight or ten on the third. *It is very important after each feeding to inject an ounce of warm water through the tube, to wash it out, then a syringe full of air to drive out the water, and then to turn the stop-cock in the tube so that no milk can run back into the tube and coagulate and clog it. Before feeding, inject one syringe full of air into the tube to empty it. It is very easy to keep the tube clean and in*

good working order if these directions are followed.

The tube is easily kept in position with a small piece of adhesive plaster fastened to the cheek. It is well to remove the tube from one side of the mouth to the other once a day to avoid irritation. The mouth must be kept clean with a mouth wash.

It is better to test occasionally to see that the tube is in proper position; give the patient a few swallows of equal parts of milk and water by mouth, and then aspirate at once through the tube; if the withdrawn liquid is milky the tube probably is not in the duodenum; if clear yellowish or greenish, it is in the duodenum.

RESULTS.

The tube was used for treatment in 34 cases, namely, 10 with malnutrition, gastropnoia and atony; 10 of persistent vomiting; and 14 of gastric or duodenal ulcer. The group of cases is too small to warrant any sweeping conclusions. I shall simply give my impressions of the results of the treatment.

We have had some of the best results of duodenal feeding in the group of severe cases of gastropnoia with atony, with dilatation of the stomach and delay in emptying, when this was combined with loss of appetite and marked loss of weight. Ordinary cases of malnutrition were not fed in this way. The tube was reserved for the severe and exceptional ones, where it was hard to get in enough food by mouth. The object was to feed up the patient rapidly and restore the tone of the stomach and nerves.

In extreme cases it may take a day or two for the tube to pass the pylorus. In two cases of this group of ten the use of the tube was given up, in one because the tube remained in the stomach for four or five days, and in one because of distress. All the rest did well; gained from four to fifteen pounds during duodenal feeding, and in the majority of cases started a permanent gain of twenty to thirty pounds after the duodenal feeding was stopped. This use of the tube is not new, but ought to be emphasized, as it proved of great value in difficult cases.

In ten cases of persistent vomiting we have had some failures, but more brilliant results. These were chiefly "medical cases" in nervous women, where a reflex or toxic cause had upset the stomach seriously; one was pregnant. I have not used it in obstructive or surgical cases. In three the tube was vomited and its use stopped; in the rest the result was very satisfactory.

I expected all the cases to vomit the tube at once, and at first it was a great surprise to find that stomachs which did not retain a few sips of water, did retain the tube, and passed it on to the duodenum, and that patients could take with perfect comfort through the tube the same food which a short time before had caused distress and vomiting when taken by mouth. It is

possible that an unusual form of treatment may help some patients by mental suggestion. It is certainly encouraging to a nervous woman, who has vomited for days, to watch the comfortable inflow of a large amount of nutritious food. It is wise to use an unusually long tube in these cases, 100 or 125 c.m., to prevent regurgitation into the stomach and vomiting.

It is especially useful if rectal feeding is not retained, and even when rectal feeding was possible, the results with the duodenal tube were far better for the reasons given above. I have come to rely upon it when other treatment fails.

In gastric and duodenal ulcer I have been very conservative in using the tube for treatment (possibly too much so). It was used only in cases without stenosis, or very marked deformity, which had resisted ordinary medical treatment, such as that of Leube or Lenhartz, in short, it was tried only in a small and rather difficult group of ulcers.

The cases were all examined with the x-ray to determine the *position and size of the ulcer*. We have used the tube in good-sized ulcers of the duodenum, but only in small ulcers of the stomach, for fear of cancer. Dr. Wm. C. McCarthy of the Mayo Clinic has told me that the large majority of ulcers of the stomach which were excised and had a crater larger than a dime, showed malignant change.

In speaking of results, we must remember that the course of gastric and duodenal ulcers is almost always intermittent. Symptoms often disappear with poor treatment or no treatment at all. This makes it very difficult to judge accurately the value of any treatment.

Our results were as follows:

In one half of the cases, seven in number, the symptoms were stopped, and recurred in one only; in the other half, namely seven, the treatment did not succeed and surgery was advised. In two, small multiple ulcers were found; in three, small ulcers with considerable adhesions; two refused operation.

The results with the tube were good, considering the difficult class of ulcers treated; nearly one-half the group of hard cases were cured of symptoms when other medical treatment had failed.

The method gives the stomach almost complete rest, and at the same time nourishes the patient; where there is much spasm of the pylorus, the method is especially useful; in these cases there may be some delay in the passage of the tube into the duodenum, but this can usually be accomplished with a little patience, or with the help of a few doses of atropin. No real difficulties were met; the average length of feeding was fifteen days. It has also proved valuable in bringing up poor surgical risks to a plane where operation could be performed.

It must be added that men who have had far greater experience, such as Einhorn, Morgan and Stockton, have used it much more freely in

ulcer and report good results, in the saving of time, improved results in difficult cases, and avoidance of surgery. My experience leads me to use it more freely in the future, in a selected group of cases, where food by mouth is stopped on account of pain, vomiting or bleeding. If the tube is well borne, it is very much better than rectal feeding; instead of the steady and usually rapid loss of weight and nitrogen in rectal feeding, the nitrogen balance is kept, and the weight usually held or increased.

In two cases of inoperable cancer of the esophagus the tube was successfully used for stomach feeding to relieve starvation and prepare the patient for gastrotomy; there was rapid gain of weight of 16 and 18 pounds, respectively. It was difficult to get the tube in: a silk thread-guide was swallowed, and a special tube tip was threaded on the guide, and gently pushed in with a stylet; in two other such cases it was impossible to get the tube in.

SUMMARY.

The clinical use of the duodenal tube (introduced by Einhorn and by Gross in 1909-10) has proved its value in a limited field. It is a valuable contribution to medicine and deserves far greater use than is being made of it now. The tube was used by the author in 90 cases; in 56 for diagnosis, in 34 for treatment.

A fluoroscopic study of the technic of the introduction of the duodenal tube showed that by placing the fasting patient successively in simple postures, the tube may be introduced into the duodenum within one-half hour in a majority of cases, where organic stenosis is not present. Spasm of the pylorus, atonic and hook-shaped stomachs may delay the tube.

A heavy Gross tube enters the duodenum more rapidly than a light Einhorn tube. A small tube (No. 8 French), with a heavy tip of at least 100 grains weight (Palefski) is the best of all for diagnostic work. It is not difficult to tell the position of the end of the tube. It is as safe as an ordinary stomach tube.

In diagnosis, examination of the duodenal contents was most useful in diseases of the pancreas and in cases of chronic jaundice. It is the only method of directly obtaining the secretions of the pancreas and liver, and avoids many of the sources of error in other indirect tests, such as the Sahli capsule, Schmidt's nuclear test, the oil test-meal, or testing the feces for ferments.

There is considerable normal variation in the pancreatic ferments as determined by our present tests; only absence or marked diminution has much value in diagnosis.

Constant marked diminution or absence of trypsin was found (with one exception) only in chronic disease of the pancreas.

Examination of the feces on the Schmidt test-diet in some cases was almost equally valuable, and simpler; in others the examination of the duodenal contents was much more valuable.

In diseases of the liver, the value of the test in deciding whether the bile passages are completely or partly closed is limited by the lack of a satisfactory test for bile in the duodenal juice.

The duodenal tube is a convenient and comfortable means of obtaining stomach contents; and more reliable than the usual stomach tube for aspirating small amounts of clear fasting contents.

In treatment, the duodenal tube of Einhorn was very useful in a selected group of cases; it was very useful in cases of persistent vomiting of nervous and toxic type. Here an unusually long tube is desirable to prevent regurgitation into the stomach. It was also useful in certain severe cases of malnutrition, with anorexia and atonic stomach.

It was useful in a limited group of cases of peptic ulcer. It was used only in cases without organic obstruction and in those which resisted ordinary medical treatment. It was used several times to improve the patient's condition before operation in ulcer, also in two cases of cancer of the esophagus (stomach feeding).

Almost every case was improved by duodenal feeding, and in a considerable number the symptoms stopped.

It is superior to rectal feeding, as patients usually keep their weight or gain, and keep their balance of nitrogen. A reservoir and the Murphy drop-method is preferred to a syringe for introducing food.

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Clinical Department.

CHRONIC INVERSION OF THE UTERUS—
REPORT OF A CASE.*

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Mrs. S., 23 years old, was delivered on March 23, 1915, by high forceps, the labor having been moderately hard. Some sewing was necessary to repair the perineum and nothing abnormal was noticed. A few hours after the delivery, there was a postpartum hemorrhage. The convalescence was then apparently normal. When the baby was two to three months old, there was some flowing, which was considered a normal menstrual period. A month later came a period with excessive flowing, on September 2 a very slight flow, and on September 12 another normal period, and on September 16 more excessive flowing.

On September 17 she was sent to me by Dr. Norton, to whom she had gone, having discovered an abnormal mass in the vagina. Dr. Norton recognized the condition, and tried without success to replace the uterus. The woman was then referred to me for operation.

Examination. The patient was a healthy-looking young woman. Examination was negative except for the pelvic organs. Inside the vagina was a mass the size of two thumbs side by side, covered with mucous membrane and easily bleeding. This mass protruded from inside the cervix, which made a loose ring about it. By bimanual examination no uterine fundus could be felt. The diagnosis of inversion of the uterus, therefore, seemed clear. The entire body of the uterus down to the region of the internal os had inverted through the cervix. On the next day, under ether, an attempt, which

* Read before the Obstetrical Society of Boston, Jan. 25, 1916.

failed, was made to reduce the inversion. The cervix offered no obstruction. The difficulty came from the uterus itself, its walls being too thick to permit of forcing it back through itself. A laparotomy was then done. There was no uterine body to be seen. It had inverted through itself and disappeared into the vagina. Into the depression the index finger passed down to the second joint, the cavity being of the right size to admit the finger. Double hooks were passed down into the cavity to the inverted fundus and unsuccessful attempts were made to pull it back into the abdomen. Attempts to get it back into position by pushing from below as well as pulling from above, also failed. The posterior wall of the inverted uterus was then divided by scissors. This opened the posterior cul-de-sac of the vagina. With the finger through this opening and a clamp on the wall of the inverted uterus, the fundus was turned back into position. The incision in the posterior wall of the uterus was then closed with two rows of catgut sutures, the first row being of chromic catgut with the knot inside the uterine cavity, the second one of chromic catgut pulling the peritoneum over the first row. The very lowest portion of the uterus was not sutured, leaving room for a wick down into the vagina. The abdominal wall was closed tight in layers.

During the first few days of convalescence, there was some increase in temperature, apparently due to congestion of the breasts, as at entrance into the hospital nursing had been suddenly stopped. The wick in the vagina was taken out in forty-eight hours. There followed a small amount of discharge for a few days. On October 2, when she left the hospital, the uterus was forward, movable, and the external os was perhaps a little large. She was seen again in December. She had had two normal periods. The uterus was found forward and movable.

In 1907, Peterson (*Surgery, Gynecology and Obstetrics*, 1907) covered the literature of chronic inversion of the uterus and published his statistics. It had been my desire to bring these statistics to date, but, after reading the reports of cases available, it seemed to me that this would be of very little value, inasmuch as no one man has had sufficient personal experience in this condition to speak of different techniques authoritatively. Each operator favors the technique used in his case, and reports the disadvantages of other methods of treatment. It, therefore, comes down to the personal preferences of the operator between vaginal and abdominal work. The surgeon who is accustomed to vaginal work will deal with his cases through the vagina, and he who prefers to go in from above will deal with his cases by a laparotomy. I doubt whether the difference in the method of approach is of much real importance, and agree with Peterson, from whom I quote, "Today any competent surgeon ought to be able to reduce the inverted uterus successfully by either way."

There are three methods of dealing with chronic inversion of the uterus: replacing the inverted uterus without operation; vaginal operative treatment; and abdominal operative treatment. Attempts to replace the inversion

without operation should always be made. They must be gentle and are rarely successful. Kronhaus, in an Inaugural Dissertation, 1911, reports a case where attempts resulted in tearing the vaginal wall so extensively that the bladder wall was exposed. He mentions a second case, where a vaginal hysterectomy was considered necessary, because the cervix had been so much traumatized.

There are several types of vaginal operation, according to the various sites of the incision. The principle in all is to divide the tissues sufficiently wide to permit replacing the fundus in position within the abdominal cavity. The incision is then sutured, and ordinarily the posterior cul-de-sac is drained. The vaginal operation may be made difficult by the presence of adhesions, which are hard to recognize from below. In a case by Gross (*Zentralb. f. Gynaek.*, 1907, vol. 31, p. 1433), reduction by vaginal incision was impossible because of the adhesions, and a laparotomy was necessary. After replacing the uterus by a vaginal operation, the body passed so high into the abdomen that Beckman (*Zentralb. f. Gynaek.*, 1914, vol. 38, p. 649) experienced great difficulty in placing the sutures. The question of infection plays a very important rôle in the consideration of these cases, for the uterus has been exposed so long that its lining membrane is usually infected.

Replacing it in the abdominal cavity may carry infection with it and result in a localized collection of pus or a peritonitis. In a number of cases it has been necessary to open secondarily the posterior cul-de-sac to allow the discharge of pus.

There is not much to be said in detail of the approach through the abdomen. By it one can see more distinctly the conditions which he is treating. The dangers of sepsis are equally as great as by the vaginal method, and the question of drainage is vital. It is to a laparotomy that many surgeons have turned after having experienced insurmountable difficulties by the vaginal approach.

The body of the uterus may have been exposed so long that it has undergone a microscopic change. Lemaire (*Bull. Soc. d'Obst. de Paris*, 1911, vol. xiv, p. 470) reports a case where the uterus had been down for eleven months. Its wall was so thick, hard, and sclerotic that, even after incision of the vagina, reposition was impossible. He, therefore, did a hysterectomy. Barboni (*Surgery, Gynecology and Obstetrics*, 1906, vol. iv, p. 125) mentions one where the inversion resulted in a fatty degeneration of the uterine wall. He did a hysterectomy.

The prognosis for future pregnancies appears to be poor. The mucous membrane of the inverted uterus seems to have been exposed so long to abnormal conditions that it has lost its normal functions. A few cases of pregnancies following chronic inversion are reported. Neugebauer

(*Zentralb. f. Gynaek.*, 1913, vol. xxxii, p. 529) has collected eleven cases. There seemed to be no great difficulty with the birth of the child. Neugebauer's own case having a spontaneous delivery, but the delivery of the placenta gave difficulty, manual extraction being necessary in a few. Each of these cases had been operated upon by some method. In each the uterine wall had been rather extensively incised and sutured. In the presence of this scar each case was delivered without accident by vagina. This is interesting. It would seem to me that the best present-day obstetricians would prefer an abdominal Caesarean section before the advent of labor.



PREGNANCY AND LABOR FOLLOWING RESECTION OF OVARY.

BY FREDERICK W. JOHNSON, M.D., F.A.C.S., BOSTON.

I REPORT this case to encourage those who do resections, where there is a chance of saving even a little healthy ovarian tissue.

The patient entered the Carney Hospital Dec. 11, 1913 (Case No. 1897) for the relief of backache and pain in both ovarian regions.

She was 24 years of age, married five years, and had had two children, the last one having been born two years previous to entering. The following symptoms date from the last confinement (2 years' duration): Irregular menstruation (once during this period went four months without menstruating), diminution in amount of flow and number of days, dysmenorrhea, profuse leucorrhea, burning and scalding during micturition. Gonococci not found. Last unwell, Nov. 23, 1913. Appendix removed five years before.

Diagnosis. Cystic left ovary. Ovarian cyst (right). December 13, 1913, the uterus was curetted. On opening the abdomen there were found chronic salpingitis of the distal half of each tube, an ovarian cyst of the right ovary the size of a hen's egg, a cystic left ovary, and the cecum adherent to the scar of the previous appendix operation. The ovarian cyst and eight-tenths of the left ovary were removed and the uterus suspended.

Pathologist's Report. Cystic ovary, dermoid cyst of ovary, and moderate hyperplasia of uterine mucosa.

Menstruation did not occur for three months after the operation. Was irregular (going over) until February 18, 1915 (2 years and 2 months). Flowed one day in March and April, 1915.

April 22, 1915, I found the uterus enlarged, both breasts enlarged and containing fluid and areolae darkened.

There were increased frequency of micturition, morning sickness, increased vaginal discharge and violet coloration of the introitus vaginae. She was "quite sick with fainting spells the first three months, but from then on was quite well."

November 26, 1915, she delivered herself of a nine-pound girl. Dr. J. S. H. Leard, who attended her, reported to me that the labor and convalescence were normal.

New Instrument.

A TABLE FOR THE REDUCTION OF DISLOCATIONS OF THE HIP AND OPERATIVE TREATMENT OF THE FEMUR AND HIP JOINT.*

BY HENRY J. FITZSIMMONS, M.D., BOSTON.

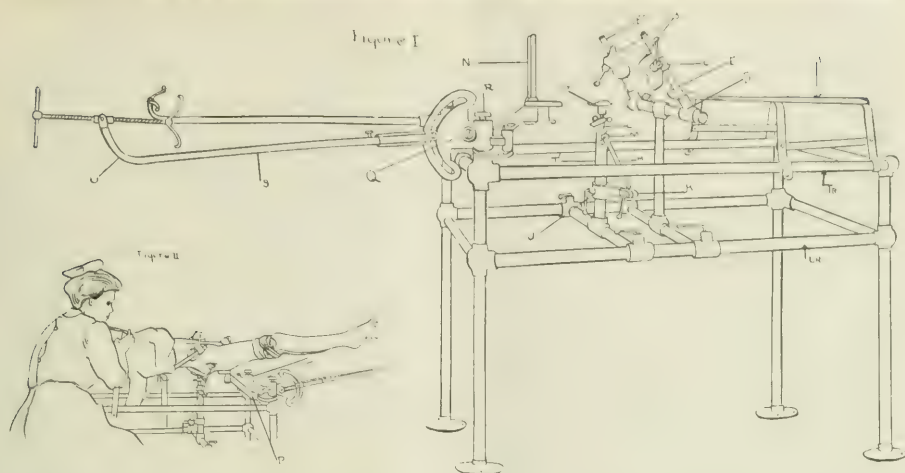
THE following illustrations and specifications are intended to place before the orthopedic surgeon a mechanical aid to more efficient work. In a previous paper the writer described a table designed to be used in the reduction of difficult congenitally dislocated hips. The table, after a year's use, showed that the principles upon which it was built were sound; but that certain of the mechanical details were faulty. The present table has been designed after study of the failures and difficulty of the past, and now has been used sufficiently to justify this report.

Motion and the proper amount of force, directed as desired and when desired, are absolutely essential to the permanent success of any form of mechanical help in the reduction of congenitally dislocated hips. The pelvis must be held absolutely, and the mechanics for doing so must be so arranged as not to injure the skin or soft parts. It is the author's belief that this has been accomplished, therefore the following description is respectfully submitted.

The table is made of standard gauge iron pipe, and is 24 in. wide, 32 in. high, and 48 in. long. The shoulder and head-rest 1 (Fig. 1) is made of sheet steel and is adjustable upon the top bars of the table Tr. It is shaped to fit the tapering of the lower thorax and to prevent incorporation in the upper portion of the plaster spica, which is placed to maintain the reduced hips after reduction. 3, The metal plates, which were modeled to fit accurately over the anterior superior spines and the iliac crests, are adjustable in all directions by means of the universal joint C, and the swing connection at D. The uprights E and E' are carried upon the firm T, which is adjustable through its sliding possibilities upon the lower rail, Lr., thus accommodating to any length of body and permitting a more definite downward or sideways hold on the iliac bones. The sacral rest G is a plate upon which rests an individually fitted plate, modeled for each case, and which should include the posterior iliac spines. This is fitted loosely to and upon the firm T', which is made of tubing, carrying a worm, which gives adjustability in the perpendicular plane. This T' is adjustable on the long diameter by its sliding possibility upon the lower bars of the table. This bar T' also carries the trochanteric push H, which is adjustable through the sliding joint J and the ball and socket joint K. This adaptability permits the cap L to be placed beneath the trochanter and firm constant pressure exerted by means of the screw and worm at M, in any direction. The perineal posts N of two bars, fitted

* Demonstrated upon two cases before the Clinical Congress of Surgeons of North America, October 23, 1915, Children's Hospital, Boston, Mass.

Demonstrated before the Interurban Orthopedic Club, December 31, 1915, Children's Hospital, Boston, Mass.



with polished cuffs and the whole upon a perforated plate O is adjustable forward and backward at P. Extension Q represents a casting which pivots around post R and allows motion in the horizontal and perpendicular planes with catch locks holding any position desired in these planes. S represents the traction arm and is 32 in. long, of tubing with a crooked arm U, which possesses at one end an ordinary winch screw for strong traction, and which maintains during use the direct relation with the long axis of the femur. The trochanteric push H, which may be raised or lowered on its post by means of thread bar and flange nut with bar M. The cup in which the trochanter rests is a loose fit upon H and easily removed by means of a string, which passes through a hole in the cup when it has been incorporated in the plaster.

METHOD OF REDUCTION.

The anesthetized patient is placed dorsally recumbent, with the head, shoulders and thorax upon the body-rest. The sacral-rest, with its previously prepared plate, is placed so that the sacrum and posterior iliac spines are supported. This position then is maintained by fixing the T on the sliding bars by its clamp nuts. The traction arm is then adjusted to its proper length with the traction in a direction parallel to the long axis of the femur. Slight traction is then started, so that the patient's symphysis pubis is snug against the perineal bars, which have previously been adjusted to accommodate to its length. The pelvic grips are now adjusted and fixed. Traction is now made slowly, in the line of the femur, until the muscles, whose shortness and contraction have partly prevented reduction, have been stretched, and the head is below the acetabulum. The trochanteric push is now adjusted, and either by direct push or as the fulcrum in a manual manipulation, the reduction should take place. The reduction having taken place, the leg is held in the desired

degree of abduction and rotation, with the trochanteric push in position and preventing dislocation. The traction arm and pelvic grips, with their uprights, are removed. Plaster is now applied smoothly, including the sacral-rest and the cup of the trochanteric push, which may be easily removed after the plaster has hardened.

The author and his colleagues at the Children's Hospital have now used the above table on several difficult cases, among which were a girl twelve years, double; a girl nine years, single; a girl fourteen years, double, whose weight was 132 pounds. All of these cases were reduced without trauma to the perineal regions and without the shock that is usually present in other forms of reduction. At present all hips reduced are in position.

Medical Progress.

REPORT ON OBSTETRICS.

By ROBERT L. DENORMANDIE, M.D., BOSTON.

OBSTETRICS A LOST ART.

CAESAREAN SECTION—OVERDONE.

MANAGEMENT OF THE PLACENTAL STAGE OF LABOR.

PITUITARY EXTRACT IN LABOR.

PREMATURE SEPARATION OF THE NORMALLY IMPLANTED PLACENTA.

THE RESPONSE OF THE SURVIVING UTERUS TO MORPHIN AND SCOPOLAMIN.

OBSTETRICS A LOST ART.

HOLMES' in a most interesting and timely article calls attention to the fact that at the pres-

ent time Caesarean section is becoming the operation of choice without sufficient indication. Holmes makes the statement that a surgeon, gynecologist or general practitioner who has not had experience in practice over a continued obstetric clientele, has not the mature judgment or qualification for the interpretation of conditions and indications for a Caesarean section and he states definitely that the evidence of a disproportion must be weighed, the character of the uterine activity must be estimated, the status of the soft parts must be considered and the surgical risks must be properly balanced. He states it is not so much the fact of the rupture of the membranes which determines an infection after the Caesarean section, as it is due to the vaginal examinations, which mean the introduction of the finger within the lower segment. Holmes deplors the fact that physicians have not schooled themselves to make necessary vaginal examinations during pregnancy, and then to limit further pelvic investigations to rectal explorations in labor. Holmes deplors the fact that so many Caesarean sections have been done for face, brow, occiput posterior, and transverse presentations which, when properly treated by the obstetric art, would have resulted successfully. Holmes reviews some of the reasons why Caesareans have been done and he comes to the conclusion that many of the indications are far-fetched. Many of the Caesareans should never be reported, for there was no real justification for their performance, and he rightly states that it is not proper for a surgeon, gynecologist or other, to lay down the indications for a grave obstetric procedure when these men perhaps have never had any obstetric experience.

His article is a welcome one to read and all who have the good of their patients at heart should read it in the original.

Holmes comes to certain definite conclusions in regard to Caesarean section. They are: that a contracted pelvis alone should be considered as a single and definitely permanent indication for Caesarean; (2) no Caesarean should be considered unless the baby is in good condition; (3) *per se* eclampsia, placenta praevia or other specious indications do not offer warranty for the operation; (4) all women with relative indication should be allowed to go into labor so that they may have a real test of the actual disproportion; (5) it is not wise nor expedient to let a patient with an absolute indication or where it is a repeated section to go into labor; (6) a Caesarean scar is a vulnerable point and, therefore, once a Caesarean, always a Caesarean; (7) Caesarean sections have been performed on inordinately broadened indications which are in many respects not defensible; (8) obstetric manual dexterity has been compromised by the development of Caesarean section; (9) one who has a mortality of five or more per cent. for Caesarean sections should revise his indications.

CAESAREAN SECTION—OVERDONE.

In an article of similar tone to the one of Holmes, Kellogg² also deplors the modern tendency of doing Caesarean sections without sufficient cause.

In his opening sentence he says Caesarean section is the most overdone operation in this community at present. He speaks of ten cases with which he was familiar which took place in private practice, in well equipped hospitals, and of these ten cases seven died.

Kellogg feels that it is not what proportion these cases represent of the whole number of Caesareans done by this group of men, but the important point is that they occurred within the year in this community among a small group of good obstetricians and, therefore, he argues that Caesarean section is not an operation to be lightly advised.

He goes over the indications that have been advised and he asks the question if on losing a patient by Caesarean on any of them, the operator's conscience in all cases can be clear. Unquestionably, Kellogg's article was written for the purpose of making men think before advising Caesarean, when there is no real indication for it. The obstetrician, general practitioner and the surgeon who will do a Caesarean on any case that he can get his hands on, will profit by reading this paper of Kellogg's in the original. That we can agree with all he says is not possible, but the object of his paper is excellent and we hope that it will accomplish what he desires.

MANAGEMENT OF THE PLACENTAL STAGE OF LABOR.

Polak³ at the Long Island College Hospital has studied for the past two years the physiology of the third stage of labor in order to determine first what is the normal and usual mechanism of placental delivery when the uterus is left entirely alone; second, are the clinical evidences of placental separation always apparent; third, what is the relative proportion of post-partum hemorrhage in cases in which the placenta is delivered spontaneously as compared with those bleedings following manual expression; fourth, in what proportion of cases is the placenta retained beyond the two hour limit; fifth, how long can the placenta be left *in utero* without danger to the mother and what are the dangers; sixth, what is the actual frequency of adhesion of the placenta.

His article is based on the placental stage of two thousand deliveries. Polak says that certain definite clinical changes indicating the separation of the placenta usually become apparent in periods from fifteen minutes to two hours. The changes are these: first, the cord descends, the fundus rises up and is found in the median line, the shape of the uterus becomes flattened backwards and the gush of blood escapes from the vagina. The hemorrhage then ceases as the uterus retracts. When these clinical evidences

of the separation of the placenta occur, the patient is asked to bear down and the placenta thereupon escapes from the vulva. If the pressure of the abdominal muscles is insufficient to effect delivery, then the uterus is grasped as in the method of Credé, and stimulated to contract. Polak says he never attempts expression until after the clinical evidences of separation are definitely apparent. The only exceptions to this routine are after operative procedures during pregnancy or before term, which have demanded immediate delivery by anterior vaginal hysterotomy or otherwise, and at term in Caesarean section, or when the woman has been subjected to a long operative delivery under anesthesia. Under these circumstances he immediately expresses the placenta with the first pain, or removes it manually. In cases where there was no uterine manipulation, Polak says that separation, expulsion, uterine retraction with the expulsion of the placenta with its fetal surface downward, the cord leading the way, was observed and noted in all such cases.

In these two thousand cases that Polak bases his article on, bleeding occurred but three times though only two cases required tamponade of the uterus, and he speaks of the marked contrast of this record compared with the previous series when it was the routine practice to manipulate the fundus immediately on delivery of the child. Five times was the placenta retained more than two hours. Three of these were delivered by

Credé's expression under surgical anesthesia. One placenta remained detached in the cornu fully thirty hours, owing to a large myoma, located in the uterus, which acted as a ball valve obstruction. Expression in this case was futile, and rather than go through a lacerated and infected vaginal area, an abdominal hysterotomy and myomectomy was done. This placenta was not properly adherent but mechanically retained. In another case, the placenta was retained for 96 hours before separation occurred and expression was resorted to. The retention was due to the retraction of the lower segment following the use of pituitrin, which relaxed under surgical anesthesia and then permitted expression. In none of these retained cases was there any amount of vaginal hemorrhage.

Polak says the dangers of retention of the placenta are sepsis and hemorrhage, and he feels that hemorrhage is negligible while the placenta is attached or detached, that sepsis is dependent wholly upon intrauterine manipulation through infected passages and not upon the retention of products of conception. One adherent placenta was found.

Polak says statistics show that ten per cent. of patients with adherent placenta which have been removed manually die of sepsis. Polak feels that the physiological separation of the placenta is hastened if the uterus is not handled after the delivery, and he further states that uterine manipulation favors retention of the placenta and membranes by interfering with the

physiological processes. Interference with this physiological process allows an incomplete separation of the placenta and an incomplete retraction of the uterus to follow. Polak's conclusions are as follows: that the placenta will separate spontaneously if the normal mechanism is allowed to obtain; (2) that any manipulation of the uterus and clinical evidence of separation taking place disturbs this normal mechanism (3) post-partum hemorrhage is best guarded against by observation of the physiological processes; (4) that the normal mechanism of placental delivery is that where the fetal surface first appears; (5) that the placenta may be retained in the uterus for hours or days without danger to the patient provided it is attached or completely detached, which insures that the bleeding will be negligible; (6) that sepsis is dependent upon the penetration of the uterus by hand or instrument through the infected passages, and not upon the retention of the placenta; (7) that manual extraction is only admissible in partial separation with hemorrhage; (8) that in retention of the placenta without hemorrhage, the cord should be cut off close to the cervix and the case watched until the signs of separation are apparent when the placenta is then expressed while the patient is under surgical anesthesia; (9) that invasion of the uterus through the vagina is dangerous and intra-pelvic delivery should be abandoned and delivery accomplished by suprapubic extra-peritoneal hysterotomy; finally, when the adhesion is so great that its removal entails the taking out piece meal of the placenta, excision of the placental site or hysterectomy should be our choice.

PITUITARY EXTRACT IN LABOR.

Johnson⁴ reports sixteen cases in which he used pituitary extract. He comes to the conclusion that the child must lie in the long axis of the uterus, that there should be no pelvic contraction and no obstruction. The os must be soft. The dose is 1 c.c. except in the inertia of multipara. It should be given in the buttocks and to get the best effect, should be at the end of the first stage with the membranes ruptured. He gives it as a routine dose, as it helps in causing the detachment of the placenta. In large doses he notices slight toxic condition in the child. He reports two cases where Burroughs Wellcome extract was used and where the effect was very rapid. One child was born in asphyxia pallida and shortly died. The second was also born in asphyxia pallida but survived.

Of the sixteen cases three babies were dead; seven babies showed marked cyanosis with rigidity and one of these seven had convulsions. Five babies were born in good condition. One of these sixteen babies was delivered by forceps after pituitary extract had failed.

Mosher⁵ in an article on the abuse of pituitary extract says, on the other hand, that pitui-

tary extract has no place in normal labor, nor in a case where there is any abnormality in presentation, and he says that the many writers who made such sweeping statements regarding the virtues of pituitary extract will lead the inexperienced practitioners into disastrous consequences for the mother or child.

He reports one case where pituitrin was used and a ruptured uterus was found. The woman died shortly after entrance to the hospital at Kansas City. Mosher definitely states that its sphere is a very limited one, not applicable in primiparae, or in any case of labor except where a delay is made at the pelvic outlet, especially in multiparae. He says that the diagnosis must be definite and the risks fully appreciated before it is decided to administer pituitary extract.

PREMATURE SEPARATION OF THE NORMALLY IMPLANTED PLACENTA.

Williams⁶ reviews the history and frequency of this condition. From his experience at the Johns Hopkins Hospital he feels that premature separation of the placenta is more common than placenta praevia. In the etiology of this condition Williams admits that trauma may be a factor, but that he knows nothing of the effect of mental emotions as a causative factor and that an endometritis if present, is merely an accidental complication, and finally that there probably exists some indirect connection between the toxæmic processes and the premature separation of the placenta.

In the symptomatology and diagnosis of this condition, Williams makes the point that while completely concealed hemorrhage is a very rare complication, ante-partum hemorrhage from this complication is quite as frequent as that due to placenta praevia. Whenever the examining finger is introduced past the internal os and fails to feel placental tissue, then the diagnosis of premature separation of the placenta should be made. He further insists that the amount of external hemorrhage is not necessarily an accurate index of either the degree of separation nor of the quantity of blood lost. He also directs attention to the altered consistency of the uterus. Whenever this organ presents a ligneous consistency in the latter part of pregnancy or early in labor, and does not alternate between contraction and relaxation, the diagnosis, he says, is partly assured. Williams says that valuable information as to the amount of blood lost may be obtained by changes in the hemoglobin content before the pulse gives any indication of the existence of shock.

He reports two cases, the first, a nullipara in her seventh month, who was seized without previous warning in the early morning with intense abdominal pain. Williams saw the patient at 9.30 A.M. and found her rolling about the bed and complaining of intense and constant pain. The uterus was unusually hard and tense and

did not alternate between contraction and relaxation. The round ligaments stood out like whiplashes. Vaginal examination showed the cervix was hard and undilated. No vaginal discharge or hemorrhage. Pulse was 80. Patient was given morphia and sent at once to the hospital for observation with the probable diagnosis of premature separation of the placenta. At 11.30 A.M. the hemoglobin was 55%. At 2.00 P.M. patient looked pallid and sicker than before. The pulse rate unchanged, but the hemoglobin was now 35%. The uterus was ligneous in consistency and apparently larger than in the morning. No external bleeding. A positive diagnosis of concealed hemorrhage was then made and a Caesarean section decided upon as the most conservative method of delivery.

By the time the patient was ready for operation the pulse had risen to 160. Abdomen opened without incident. Clear amniotic fluid escaped under great pressure. The dead, seven-months child was extracted and immediately thereafter the completely detached placenta came into the wound, and upon removing it, a large amount of fluid and coagulated blood escaped. Examination of the uterus showed the whole right side to be dark purplish red in color. The median end of the right broad ligament was considerably swollen and also the lateral two-thirds of the tube. The uterus showed no tendency to contract. Two c.cm. of pituitrin were given and hot applications used and also the interior of the uterus rubbed with iodoform gauze, but all without effect. Williams then decided to remove the uterus, which he did without difficulty.

During the days following the operation the patient improved less rapidly than anticipated. In the evening of the fifth day the pulse became weaker and more rapid. She was then transfused, with only temporary benefit. She gradually improved, however, and in three weeks after operation left the hospital.

Examination of the placenta showed no white or red infarcts, maternal and fetal surfaces were normal except for a pronounced marginata. There was no coagulated blood adherent to its maternal surface. The uterus was found to be unusually flabby. The posterior surface of both margins, but particularly the right margin of the uterus, presented a bluish, purplish coloration due to the effusion of blood. Horizontal section beneath the insertion of the tubes showed that three quarters of the section presented a bluish, purplish appearance due to blood extravasation between the muscle fibres.

Microscopic examination of the placenta showed it to be perfectly normal. Microscopic sections of the uterus wall showed no traces of inflammation. At the placental site there was an unusual amount of fibrin and just beneath the decidua basalis, large quantities of blood lay free between the muscle fibres. Profuse hemorrhage was found throughout the muscularis. In places the blood had entirely disassociated the

muscle fibres, thereby explaining why the organ had failed to contract. The large veins were uniformly empty, but in the walls of many, free hemorrhage had occurred just beneath the endothelium and communicated freely with the hemorrhage effusion between the muscle fibres. In some of the smaller arteries the intima was swollen in places and projected into the lumen. In these areas peculiar defects were found which appeared as clear circular or elliptical zones. Throughout these areas nuclear fragmentation and a typical arrangement of the cells was observed. From the examination, Williams' diagnosis is premature separation of the normally implanted placenta, concealed hemorrhage, hemorrhagic infarction of the uterus, degenerative arterial changes.

The second case was an eighteen years old multiparous patient, nine months pregnant, with albumen in the urine and some edema of the feet, on the first examination. In the following two weeks no albumin was found. Labor began one night and at six o'clock the next morning a gush of blood from the vagina appeared. Six hours later she was seen by the out-patient department and brought at once to the hospital. Examination showed considerable amount of dark red blood escaping from the vagina. Pulse 128. Blood pressure 100. Temperature normal and hemoglobin 32%. The uterus was so hard and boardlike that the child could not be palpated. No fetal heart sounds heard. Vaginal examination showed the os to admit one finger; cervical canal intact; no placental tissue felt.

Williams then did a Caesarean section and a condition similar to that observed in the first case was found. Here again because the uterus did not contract a hysterectomy was done. The convalescence was complicated by sepsis with mass formation which, when opened and drained, healed rapidly. The urine at the time of discharge showed signs, according to Williams, of a chronic nephritis.

Examination of the specimens showed changes in the muscularis and in the arteries similar to those observed in the first case.

Williams thinks that the arterial changes which were found are not mere accidental findings, but in all probability, were caused by a toxic substance which came from beyond the generative tract.

Williams concludes that (1) premature separation occurs much more frequently than is generally believed and may give rise to only trifling clinical symptoms, or may put the patient's life in the greatest jeopardy; that (2) the accident is associated with profound disorganization of the uterine muscle; and that (3) its causation is probably dependent upon some as yet undifferentiated form of toxemia.

Williams says that in general the decision to interfere will depend upon the amount of blood lost and the general condition of the patient. The method of interfering will depend upon the

patient's condition and the condition of the soft parts.

He closes his article with an excellent bibliography.

THE RESPONSE OF THE SURVIVING UTERUS TO MORPHIN AND SCOPOLAMIN.

Because of the wide employment of morphin and scopolamin in obstetrics, the authors' decided to study the action of these drugs upon the uterus. They used guinea pigs and cats; both non-pregnant and pregnant. The uterus was removed from a freshly killed animal and suspended according to Kehrer's method in continuously oxygenated Locke's solution. Solutions of varying concentrations were applied to the uterus. The results are shown in a series of tables and tracings and the conclusions the authors arrived at are that:

1. Morphin in concentrations of from 0.05% to 0.1% stimulates the isolated uterus to an increase in tone.
2. Scopolamin, in concentrations of 0.005% to 0.06% increases the tone of the isolated uterus. In this respect, therefore, it appears to be about ten times as powerful as morphin.
3. No inhibitory action upon the tone of the uterus could be obtained with either of the substances. Very high concentrations of either tend to produce a tetanic condition of the organ.
4. No synergism or antagonism could be demonstrated in the direct action of these drugs upon the uterus.

In another article by Barbour on the action of morphin and scopolamin upon the intact uterus, he concludes that neither morphin or scopolamin causes profound changes in the activity of the pregnant or non-pregnant uterus of deerebrate cats, and that the statement that large doses of these narcotics inhibit the activity of the uterus, is not applicable to any direct action of these drugs upon this organ. The delay in labor produced by either or both of these drugs is probably due entirely to their cerebral action.

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Reports of Societies.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

(Section on General Medicine.)

MEETING OF MONDAY, OCTOBER 25, 1915, AT 8.15 P.M.

DR. JAMES E. TALLEY, in the Chair.

REPORT OF A CASE OF TABES DORSALIS WITH PAINLESS GASTRIC CRISES; PRESENTATION OF PATIENT.

BY DRs. EMERSON AND WILSON, SERVICE OF DR. DAVID RIESMAN.

The patient had several attacks, beginning August, 1915, of extreme nausea and vomiting without pain. Examination disclosed fixed pupils and absent knee jerks, and although syphilitic infection was strenuously denied, examination of the blood gave a very strongly positive Wassermann reaction. The importance of bearing in mind gastric crises in order to avoid, perchance, unnecessary operation was emphasized.

DISCUSSION.

DR. DAVID RIESMAN: We thought it of interest to bring this case before the Section on account of the importance, as emphasized by Dr. Emerson, of preventing surgical treatment in cases of this sort. Several months ago I saw a man who had been taken with vomiting and pain on a trip in the West. After his return to Philadelphia the vomiting continued and there was much abdominal pain. The man was 38 years of age, single, well-nourished and had always been healthy. He was seen by his family physician and a diagnosis was made of intestinal obstruction. Operation was advised, the surgeon had been called, but the man was too ill to have anything done. Upon examination I could discover nothing in the abdomen, which was almost scaphoid. The man presented a pathetic picture. I got him up with some hesitation. I thought his condition might be due in part to weakness and in part to ataxia. The knee jerks were absolutely gone. He recovered without much trouble. Whether or not the recovery was due to our treatment I do not know. He recovered under lavage and by our giving him virtually nothing to eat but buttermilk and albumen-milk in teaspoonful doses. The blood test gave a positive Wassermann reaction, and he then admitted that he had had syphilitic infection and had also had a salvarsan injection two or three years before. More recently we made spinal puncture when the fluid gave a positive Wassermann reaction. The man has minimal signs of tabes dorsalis. It is noticed that after the attacks subside there is a suggestion of movability in his pupils. Upon looking up this particular point I found that in attacks of gastric crises the pupils, which may not have been entirely fixed, become fixed, and afterwards may attain a slight degree of movability. This was the case in our patient at Blockley and in the case of which I have just spoken. The two points to be emphasized regarding the case exhibited are: (1) The existence of painless gastric crises; (2) the fact that in all cases of vomiting in the

young and in not too old persons, one ought, if there is no visible cause, to bear in mind the gastric crises of locomotor ataxia, whether there be pain or not.

DR. ALFRED GORDON: I have seen cases of tabes with so-called crises, but without pain. I remember two cases of laryngeal crises consisting of a sense of contraction with hoarseness and inability to emit sounds. Crises do not always mean a sudden onset of a condition with pain. While in tabes the crises are usually painful, if we read all reports of cases of tabes with so-called crises we shall find there are sudden attacks of a condition dependent upon the organ involved, and that pain is not a necessarily accompanying element.

TWO CASES OF BRONCHIAL ASTHMA TREATED BY VACCINES.

DR. T. G. SCHNABEL: The first cases showed no benefit by the use of a number of autogenous vaccine preparations. The second was relieved completely of symptoms by the use of only one of a number of vaccine preparations. This contained only, in addition to the organisms found in the other preparations, an unidentified streptothrix. Relief lasted for three weeks, when there was a slow return to the former asthmatic attack. Nothing but opiates had given these patients any comfort. Numerous efforts were advised to obtain the offending organisms in a given case of asthma. The vaccines combined with the proper operative procedures may be of some benefit.

TREATMENT OF DIABETES WITH SPECIAL REFERENCE TO ALLEN'S METHOD.

BY DR. ALFRED STENGEL AND DRs. L. JONAS AND DR. J. H. AUSTIN.

In the treatment of diabetes mellitus in the wards of the University Hospital it has been found that the majority of cases become sugar-free within a week when placed upon a carbohydrate-free diet consisting of eggs, bacon, meat, cheese, butter, cream, olive oil, broth, coffee, tea, lettuce and green vegetables. This diet contains no bread of any kind. It contains about 80 gms. of protein, 190 gms. of fat, 3 gms. of carbohydrate exclusive of that in the green vegetables, and 2200 calories. The prompt disappearance of sugar from the urine upon this diet occurs frequently in cases that have been for some time under treatment without avail before admission. The results obtained in the ward we attribute chiefly to two factors: (1) absolute rest in bed; (2) the avoidance of any form of "diabetic" bread. When the patient's tolerance improves sufficiently, bread of the ordinary kind rather than a "diabetic" bread is permitted in strictly limited amount. For the severer cases, especially in young individuals, Allen's treatment has been found of great value. Prompt disappearance of the glycosuria and equally prompt reduction of the ketones in the urine to less than three grams per day, has been secured in a series of cases in from two to four days of fasting with alcohol. Only a very moderate loss of weight occurs during the fast and there is a prompt restoration as a rule upon resuming feeding. The patient often bears the fasting better than the previously restricted diet. A second period of fasting has in some instances resulted in an increased subsequent tolerance for food. We find that while

Allen's treatment is desirable in only a small proportion of all diabetics, it affords a means of shortening the first stage of the treatment of those diabetics who do not promptly become sugar-free when placed upon a carbohydrate-free diet, and is the most effective treatment for the severe cases of diabetes exhibiting high ketonuria.

DISCUSSION.

DR. ALFRED STENGEL: The history of this case emphasizes the slowness of recovery of the carbohydrate tolerance in these patients. I have had experience with one case which I think I might be permitted to regard as a definite cure. The patient was a young man admitted under my treatment before the Allen treatment came into vogue. There was an output of 690 grams of sugar in some 8000 c.c. of urine a day. He has now been free of any sign of sugar in the urine for about eighteen months. In prognosis it has been my experience that, when there could be traced a connection between the onset of the diabetes and recent recovery from a severe infectious disease, generally speaking, the prognosis is somewhat favorable. I have now under my care a patient who a year ago developed sugar in the urine from what appeared to be a sharp infection. We have been able to render him sugar-free without resorting to the Allen treatment.

DR. JOSEPH SAILER: One point upon which Allen lays emphasis is that diabetics have a certain caloric tolerance and that if this tolerance is disregarded distinct injury is done, bringing about a return of the glycosuria and polyuria. I infer that this effect is dependent upon a certain amount of impairment of the pancreatic function and inability to assimilate food. Allen, therefore, desires to keep the patient at a low level of fat.

DR. DAVID RIESMAN: The Allen treatment does mean, I think, an epoch in the treatment of diabetes. Under Allen's theory we have taken a new departure and are treating cases upon a more intelligent basis. We put the patient in a position to be cured by gradually raising the carbohydrate tolerance. I have tried the Allen treatment in three cases, and in every instance the sugar disappeared from the urine in an unusually short time. In one case, the patient was so delighted with the result that he would not stay in the hospital. He did not adhere strictly to the diet and in less than three months he died. If the Allen treatment has done one thing more than another, it has enabled us to work a great deal better with our intelligent patients.

DR. JAMES E. TALLEY: A question of special interest I think is the juvenile case. I have in mind a boy of fifteen who had had diabetes for a year when I first saw him. During the first six months of treatment under the ordinary procedures he did fairly well. There was then a change and he was headed straight for coma. This was after Dr. Allen read his paper in Washington, and I took up the question with the boy's father. He came into the hospital, and it took eight days under the Allen treatment to get him sugar-free. One thing which impressed me was the voracious appetite of the patient. Under the old regime he did very well for a few months, and the Allen treatment has saved

him for the time being. What the ultimate outcome will be we cannot tell.

DR. S. SOLIS COHEN: Eighteen months ago I saw a girl between the ages of 13 and 14, who was said to have had sugar in the urine for a long time. There was no acetone, no diacetic acid; there was much emaciation. She was put into the hospital for a week under rest, and the sugar disappeared. She was kept under observation for a month before she was allowed to go home. I saw her again a year later. The sugar had not returned nor had it been found by the local physician. I am inclined to think that perhaps we have in children, as well as in adults, transitory glycosuria which is not diabetes. I have seen no severe case of diabetes in such a young person with ultimate recovery.

DR. JAMES TYSON: I have lived long enough to have passed through a great many of the cures for diabetes. At one time I was quite a believer in the utility of milk as a diet in diabetes, and skimmed milk, too, but I learned that milk behaves differently with different diabetic patients. As a result of my experience I have come to use it almost not at all. A valuable feature of the Allen treatment is the wonderfully encouraging effect which the report of the disappearance of sugar has upon the patient.

INTRATHECAL INTRACRANIAL INJECTIONS OF AUTO-NEOSALVARSANIZED SERUM FOR UNUSUALLY SEVERE AND PERSISTENT HEADACHE OF SYPHILITIC NATURE.

DR. ALFRED GORDON: The relative value of various forms of treatment of syphilitic affections of the nervous system is discussed, and the conclusion drawn that auto-salvarsanized serum is the best method. I have used the method in 100 cases. The reasons for the small success or failure of the treatment in paresis and other syphilitic affections of the brain are given and attention called to the experimental work of Campbell with trypan blue. It would seem that the flow of the fluid is spinalward, but not in an upward direction, and this is the chief reason of insignificant results when the intraspinal route alone is employed. The history of the patient upon whom the intracranial method was so satisfactorily employed is, briefly, as follows: A man of middle age contracted syphilis at the age of twenty-five. Two years ago he began to suffer with headache. The pain affected the neck, occiput and left parietal region. The man also presented optic neuritis, plus knee-jerk and involvement of the sphincters. The diagnosis was cerebrospinal syphilis. The Wassermann was positive. The man at first had five intravenous injections of salvarsan. When he came under my care he was treated intraspinal, had seven intradural injections, but there was no relief from headache, although the spinal symptoms were improved. For continued intense pain in the left parietal region a decompressive operation was done. A somewhat thickened bone was found and grayish particles were seen on the dura. The headache was somewhat improved but soon returned with the same severity. I finally decided upon an intracranial subdural injection of neosalvarsanized serum which was followed by most satisfactory results. At the present time, about six months since the treatment, there has been no recurrence of pain.

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DEATH OF TWO VENERABLE PHYSICIANS.

IN the issue of the JOURNAL for April 20 we commented editorially on the longevity of a remarkable group of four nonogenarian physicians. One of these, Dr. Samuel Franklin Coues, the second oldest living alumnus of Harvard College, and senior graduate of Jefferson Medical College, died at Cambridge, Mass., on May 1, 1916. He was born on Sept. 17, 1825, in Portsmouth, N. H., and graduated from Harvard in 1845. In 1849 he received his medical degree, and on Feb. 25, 1851, entered the United States Navy as assistant surgeon. He served throughout the Civil War, was made medical director on Aug. 13, 1876, and retired with that rank in September, 1887. Since that time he had lived in Cambridge. He was a Fellow of the Massachusetts Medical Society. He is survived by his three sons, one of whom is a Boston

physician, and a frequent and valued contributor to the JOURNAL.

It is singular that almost simultaneously with Dr. Coues' death should have occurred that of the senior alumnus of Yale College and Medical School, Dr. David Fisher Atwater. Dr. Atwater was born at North Branford, Conn., on Oct. 29, 1817. He received the degree of A.B. from Yale in 1839, and that of M.D. in 1842. After spending twelve years in the practice of his profession at Brooklyn, he removed to Bridgeport, Conn., and later to Springfield, Mass., where he died on May 2, 1916. He is survived by one daughter and one son.

IMPORTANCE OF THE MOSQUITO.

SOME interesting figures are given in the report by R. H. von Ezdorf, surgeon in the United States Public Health Service, on the prevalence of malaria in certain of the Southern States. Blood smears were examined for the presence of the malarial parasite. In a total of 13,526 examinations, 13.28% were positive; that is, one out of every 7.6 persons examined, was found to be a carrier. The percentage of infection among the whites was 8.8% and that among the colored 20.6%. The percentage of carriers was highest in children between one and three years of age inclusive. Two cases of tertian malaria were found to every one of the estivo-autumnal type; only two pure quartan and one mixed quartan and tertian were found in a total of 2391 infections. It is estimated that one out of every four infected persons harbors the sexual forms necessary for infecting a malaria bearing mosquito. Thus on an average, one person in every thirty-two (of the 13,526 examined), would be a potential malaria carrier.

The importance of this disease is suggested by the percentages of infection, which varied from 7.8% in North Carolina to 31.2% in Mississippi. The economic loss directly attributable to malaria is not to be disregarded. In one small area in North Carolina supporting a population of 4100, mostly whites, 200 people were sick in bed with malaria during October 1 to 5, 1913; in the month of September, 1913, one cotton mill in this district averaged 25 idle looms per day because of lack of help. An anti-malarial campaign was instituted; swamps drained, ditches oiled, malaria carriers hunted up and treated.

On October 1, 1915, only one person was sick in bed with malaria; the mills were running every loom and the proportion of people found infected had decreased from 13.75% to 4.45%.

In the North this problem is not so acute; it is, nevertheless, one which should be handled intelligently. Prevention of the spread of the disease is, of course, achieved by the extermination of the anopheles mosquito. New York has recently had an anti-mosquito week during which every one was exhorted to clean out puddles, rain barrels, old tin cans and broken bottles in which these insects might breed. The mosquito, like the fly, has been looked upon as a legitimate scourge with which we must bear. Now that he is assuming an economic importance we are realizing that, after all, something can be done with reasonable prospect of success to limit his malign activities.

NEW VIEWS ON AN ANCIENT PROBLEM.

THE "Final Report of the Royal Commission on Venereal Diseases," as summarized in the April number of the *Edinburgh Medical Journal*, shows care in its compilation and conservatism in its recommendations. The latter, thirty-five in number, bear upon the subject from five different points. First of all, there should be available accurate statistics regarding the incidence of venereal disease. The Commission does not advocate any system of notification of these diseases at the present time; it does advise the confidential registration of causes of death, the notification of cases of still-birth occurring before as well as after the 28th week, a uniform system of records of sickness in hospitals and poor law establishments, and an accurate record of the number of cases supplied with free salvarsan or its substitutes, or treated for venereal disease in institutions partly supported by grants from the National Exchange.

Considerable emphasis is laid on the prevention of venereal diseases by education of the individual. The Commission recommends that "more careful instruction should be provided in regard to moral conduct as bearing upon sexual relations throughout all types and grades of education. Such instruction should be based on moral principles and spiritual considerations,

and should not be based only on the physical consequences of immoral conduct." Instruction of this kind should be given students before leaving school, and should be provided in evening schools, factories, workshops, and in the Army and Navy. In elementary schools, detailed instruction in class on sexual matters should not be undertaken.

In the diagnosis of venereal diseases, the best facilities should be provided. The county should serve as a unit for this purpose, and the laboratories of universities and hospitals should be freely utilized. The cost of this service should be met as to 75% from Imperial funds, and as to 25% from local rates.

It is in regard to the treatment of venereal disease that the Commission advises the most radical changes. Good and sufficient treatment for all who need it, administered under reasonably agreeable conditions, and if necessary, at the public expense, is their recommendation. Medical students must be trained in the proper management of these diseases; evening clinics should be established for the working classes; the best modern treatment should be instituted in poor houses and prisons. All advertisements of remedies for venereal diseases should be prohibited, and to every patient suffering from either syphilis or gonorrhea, should be given regulation cards bearing appropriate directions for the prevention of contagion, and for the hygiene of treatment.

The relation of venereal disease to the community is dealt with in the recommendation (to which two commissioners dissented) that the detention of poor law patients suffering from venereal disease should be made possible. The Commission recommends further that it be made lawful for a medical practitioner to communicate with a parent, guardian, or other person directly interested in the welfare of a woman or man, with the object of preventing or delaying a marriage with a person who is in an infectious condition from venereal disease, and that statutory recognition be given to the principle that infectious venereal disease constitutes an incapacity for marriage.

The perusal of these recommendations reminds one of a page from the second part of "New Worlds for Old." The difference between such a carefully thought-out plan as this, and the entire lack of policy with which, in the past, those suffering from venereal diseases have been allowed to vacillate between the quack and the

"friend who works in a drug store" seems tremendous. The old order changes, however, and already we have a number of the preceding recommendations carried out by private initiative. The evening clinic, the much-maligned "follow-up system" of the larger hospitals, the diffusion of knowledge concerning venereal disease—all exert their influence upon the victim of venereal disease, and persuade him to continue treatment until he is no longer infectious. The State is now providing aids to diagnosis; the next logical step is the provision of adequate facilities for the treatment of cases in the infectious stage.

THE TRUDEAU FOUNDATION.

WHEN the history of medicine in this country shall be written, Edward L. Trudeau will be named as among those who have materially influenced medical progress. It was he who showed the possibilities of sanitarium treatment, and instituted a movement for the segregation, and often the cure, of the tuberculous—a movement the importance of which is not yet appreciated by the nation to which it means so much. Himself an invalid from this disease, his sympathy was especially great for doctors and medical students who were similarly afflicted. At Saranac Lake they were given every encouragement, not only to regain their health, but to take advantage of their misfortune by studying in the laboratory and clinic of the Adirondack Cottage Sanitarium the disease in which they were so vitally interested. Trudeau hoped that, through research into the nature, causes and treatment of tuberculosis, a cure would ultimately be discovered.

In order to carry out his plans in this respect, to provide instruction in the best methods of caring for tuberculosis, both from the social and from the medical point of view, and to offer to young physicians who are undergoing treatment for the disease, fellowships which will allow them to engage in research work, the Trustees of the Adirondack Cottage Sanitarium at Saranac Lake announce the formation of the Edward L. Trudeau Foundation. They hope to raise a fund, the income of which will amount to at least \$25,000 a year. Such a Foundation would indeed be a fitting memorial to a noble life.

MEDICAL NOTES.

MEETING OF THE AMERICAN ASSOCIATION OF ANESTHETISTS.—The fourth annual meeting of the American Association of Anesthetists will be held at Detroit, Michigan, on June 12, 1916. The program will consist of the following papers:

President's Address, Instruction of Medical Students and Hospital Internes in Anesthesia.

Team work. Charles W. Moots, Toledo, Ohio.

Some Bodily Changes During Anesthesia. F. C. Mann, Mayo Clinic, Rochester, Minn.

Anesthetic Records and Statistics of Anesthesia. Albert H. Miller, Providence, R. I.

Why Spinal Anesthesia Fails. F. Wayne Babcock, Philadelphia, Pa.

Essence of Orange-Ether Sequence by the Closed Method. I. D. Kruskal, Brooklyn, N. Y.

Alcoholism and Drug Habituation as Complicating Factors of Anesthesia. F. H. McMecham, Cincinnati, Ohio.

Experimental Research into Nitrous Oxid and Ether in Special Reference to: *a.* Certain Effects on the Organs of the Body; *b.* Certain Relations to Normal Sleep; *c.* Certain Relations to Infection. George W. Crile, Cleveland, Ohio.

Anesthesia in Epileptics. Walter H. Mytinger, Cincinnati, Ohio.

Ether-Oil Colonic Anesthesia. Walter Lathrop Hazelton, Pa.

On the Signs of Shock and its Complications Before, During and After Operation. Joseph C. Bloodgood, Baltimore, Md.

Physiology of Colonic Anesthesia. Walter S. Sutton, Kansas City, Mo.

Chloroform-Ether Sequence, with Summary of Results to Date. Ralph P. Beebe, Kalamazoo, Mich.

Some Observations on the Relation of Blood Pressure to Anesthesia. Mary V. Madigan, Portland, Oregon.

Relative Values of So-Called Warmed and Unwarmed Ether Vapor. Benjamin Franklin Davis and Franklin B. McCarty, Chicago, Ill.

The nominations for officers for the coming year are:

President, Walter M. Boothby, Boston, Mass.; vice presidents, F. W. Nagel, Montreal, Can.; Albert Miller, Providence, R. I.; Mary E. Botsford, San Francisco, Cal.; secretary and treasurer, James T. Gwathmey, 40 East 41st St., New York, N. Y.

DEATH RATE IN NEW YORK CITY.—The figures compiled by the Department of Health show that the death rate in New York City for the week ending May 1, was .80 lower than the corresponding week of 1915, the rates being respectively, 14.83 and 15.63 per one thousand of population. This decrease is equivalent to a saving of 86 lives. In other words, had the death rate of the week ending May 1st, 1915, prevailed during the past week, 1674 deaths would have occurred instead of 1588.

Still more gratifying is the fact that the death rate for the first eighteen weeks of 1916, is 15.44 as compared with 15.65 for the corresponding period of last year. The mortality of the following diseases showed noteworthy decreases: measles, scarlet fever, diarrheal diseases, pneumonia,—both lobar and broncho, pulmonary tuberculosis and heart disease.

The following causes of death showed slight increases: diphtheria, croup, whooping cough,

digestive diseases, cancer, bronchitis, nephritis and diseases of the nervous system.

Practically the entire saving of life was among the group under five years of age.

A RESOLUTION IN REGARD TO THE KENT BILL.—The Executive Committee of the National Association for the Study and Prevention of Tuberculosis has passed the following resolution:

1. Resolved. That the participation of the Federal Government in the study and control of tuberculosis problem is desirable and necessary.

2. Resolved. That the proper Federal agency for this purpose is the U. S. Public Health Service.

3. Resolved. That a careful study by the U. S. Public Health Service of the tuberculosis situation throughout the country, including the subject of non-resident indigent tuberculous patients and of all the other factors entering into the causation, treatment and prevention of tuberculosis, should be the first step in the Federal participation in the solution of the problem.

4. Resolved. That for the purpose of making such a study and for the further purpose of standardizing, so far as possible, the care, treatment and prevention of tuberculosis throughout the United States, there should be established in the U. S. Public Health Service, a division of tuberculosis.

5. Resolved. That for the purpose of aiding in such study the United States Public Health Service be authorized to appoint an Advisory Commission to consist of physicians and laymen.

6. Resolved. That the Executive Committee of the National Association for the Study and Prevention of Tuberculosis pledges its coöperation in carrying into effect the plans above mentioned, and will place all facts in its possession at the service of the United States Public Health Service.

MO-QUITOES IN THE MOVIES.—As part of the educational work campaign carried on recently to rid New York of mosquitoes, the Health Department's Bureau of Public Health Education has prepared motion pictures giving the complete life history of the insect. These pictures are now being shown in the larger movie houses and will eventually appear in every moving picture theatre in the city.

At the Department of Health, reports were received from the squad of sanitary inspectors sent out to discover possible mosquito breeding places in and about dwelling houses in the city. Nearly a score of obstructed roof gutters were discovered in one small district on the East Side. In Brooklyn and Queens littered back-yards were found to be a frequent source of trouble. Staten Island yielded relatively few sanitary violations, a fact which was ascribed to the persistent mosquito work which has been carried on in that borough.

PREVALENCE OF RABIES.—From having been a comparatively rare disease ten or fifteen years ago, rabies has come to be alarmingly prevalent among the dogs in New York City. In 1907, there were only three cases of rabies in animals in the Borough of Manhattan; last year there were 36, an increase of 1200 per cent. During 1914 the number of mad animals in the Borough of Manhattan reached the alarming total of 150. This led to the enactment of the present dog-muzzling ordinance, strict enforcement of which is bound gradually to eradicate this dangerous disease from this city.

The incidence of rabies in New York City for the past nine years may be judged from the following statistics:

YEAR	DOG BITES REPORTED	RABIES IN DOGS	RABIES IN HUMANS BEINGS
1907	1104	37	28
1908	4622	104	16
1909	5168	57	7
1910	3792	75	7
1911	4509	212	11
1912	4192	239	6
1913	4366	139	8
1914	4462	318	8
1915	3648	113	1

UNITED STATES CIVIL SERVICE EXAMINATION.—Assistant epidemiologist (male), \$2000-\$2500. June 6, 1916. The United States Civil Service Commission announces an open competitive examination for assistant epidemiologist, for men only. From the register of eligibles resulting from this examination certification will be made to fill vacancies in this position in the Public Health Service, at salaries ranging from \$2000 to \$2500 per annum, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The duties of this position will be to make epidemiologic and sanitary surveys to determine the prevalence and causation of disease, to conduct laboratory studies in relation thereto, and to recommend measures to prevent and control outbreaks of disease. Further information may be obtained from the United States Civil Service Commission, Washington, D. C.

OPERATION OF FOOD AND DRUG ACT.—It is reported that bills of information have been filed in the United States District Court by the district attorney against the C. I. Hood Company and the Red Cross Chemical Company. The former concern, selling Hood's Compound Extract of Sarsaparilla, is charged with making unfounded claims for its product. The latter concern sells a disinfectant and deodorizer which it declares to be a satisfactory disinfectant, if a small quantity is added to two gallons of water. This statement the government takes exception to.

DEATH RATE OF THE COLORED POPULATION.—From a study of the comparative death rates

of the colored and white population of various areas in the United States, Assistant Surgeon General Trask of the Public Health Service concluded that the colored death rates of most communities of the United States are not discouragingly high; that they are undoubtedly lower than they have been in the past; that they are as low as many white population groups possessed 20 or 30 years ago, and are in fact as low as some white populations possess at the present time; and that with the economic and industrial progress of the colored population, its death rate will gradually approach nearer to that of the white population.

AMERICAN NURSES' ASSOCIATION.—At the annual meeting of the American Nurses' Association in New Orleans, on May 3, Miss Annie Goodrich, R.N., of New York, was elected president of that organization, and Miss Mary Beard, R.N., of Boston, president of the National Association for Public Health Nursing for the ensuing year.

SMALLPOX IN DELAWARE.—Report from Wilmington, Del., on May 2, states that smallpox is at present epidemic in that city, 34 cases of the disease having been reported in the previous three weeks.

HYGIENIC LABORATORY PINE OIL DISINFECTION.—In the issue of the JOURNAL for Oct. 21, 1915, (Vol. clxxiii, p. 632) we commented on the use of hygienic laboratory pine oil disinfectant. The following directions have recently been given for its manufacture:

"Heat in a covered enamel iron pail 1000 grams (a gram is 15.4 grains) of pine oil with 400 grams of pulverized resin until dissolved. Cool to 80 degrees C. (176 degrees Fahrenheit) and add 200 grams (25 ounces) of a 25% solution of sodium hydroxide (caustic soda). Agitate thoroughly for at least 10 minutes with a rotary Dover egg beater; add water sufficient to make mixture to the original weight and cool by placing the pail in ice water. Use cool water for diluting.

"In making this disinfectant use clear, transparent pine oil obtained by the steam or solvent process, not by destructive distillation. This oil distills at 207 degrees, and 85% of it will go over between 207 degrees and 230 degrees. The resin used should be strained North Carolina grade E resin, ground.

"The oil costs 40 to 50 cents a gallon, the resin about two and one-half cents a pound, and the total cost should not exceed 50 cents a gallon."

EUROPEAN WAR NOTES.

SURGICAL CONGRESS AT WARSAW.—Report from Berlin on May 4, states that the annual congress of German army surgeons is now being held this year at Warsaw, and is attended by 1500 surgeons, including many university professors, and the chief surgeons of the Austro-

Hungarian, Bulgar, German and Turkish armies. The address of welcome was delivered by General von Bessler, military governor of the Warsaw district. Dr. Schjerning, surgeon-general of the German army, stated in a paper that there are at present over 24,000 surgeons in the army, in addition to 3000 Red Cross physicians, 400 dentists, 1000 pharmacists and 92,000 soldiers in the sanitary corps in the field, 72,000 in Germany and 22,000 at army bases back of the lines. There are 238 hospital trains in service, and eighteen large disinfecting stations which are able to attend to 100,000 soldiers daily.

TWO NEW RELIEF FUNDS.—Two new relief funds for the European War have recently been initiated in the United States. Both have to do with the relief of the disabilities arising from injuries to the face.

The first is a fund for the foundation in France of an American hospital for wounds of the face and jaw. It is in charge of a national committee and of state committees throughout the Union. The Massachusetts committee consists of the following members:

Charles M. Proctor, D.M.D., chairman, 419 Boylston Street, Boston; William Rice, D.D.S., D.M.D., secretary, 149 Newbury Street, Boston; N. Penrose Hollowell, treasurer, 44 State Street, Boston; Edward C. Briggs, M.D., D.M.D., 129 Marlborough Street, Boston; Geo. C. Ainsworth, D.D.S., D.M.D., 45 Bay State Road, Boston; George H. Payne, D.D.S., 29 Commonwealth Avenue, Boston; Harvey W. Cushing, M.D., Peter Bent Brigham Hospital, Brookline; George B. Rice, M.D., 220 Clarendon Street, Boston; George H. Monks, M.D., Harvard Medical School, Brookline; William J. Mixer, M.D., 180 Marlborough Street, Boston; R. C. Greenough, M.D., Massachusetts General Hospital, Boston; Arthur F. Estabrook, 346 Commonwealth Avenue, Boston.

This committee has recently issued the following circular of personal appeal:

"Your help is needed in the great work of restoring horribly mutilated human brothers to the semblance of human beings.

"In the first twelve months of the war the official reports show 6,490,000 wounded. In this terrible sum of human misery there has been little time to think of after-effects.

"It is comparatively nothing that part of a man's face is shot away. If his life is not in danger he must leave the hospital as soon as possible to make room for a new victim.

"Because of the character of trench warfare, the number of facial wounds has been in proportion far greater than in any other war, and the accommodations, as to hospital space, are badly lacking. After first treatments the patients are now crowded out because the room is an imperative necessity in the never-ending battle to save life. There is no hospital devoted en-

tirely to the full treatment of these wounds, although several institutions are now carrying on the work to the limit of their capacity. The consequence is that a heroic young man may go out into the world in possession of his strength and all his faculties, but with so revolting an appearance that people shrink from him on the street. Noses are blown off, cheek bones crushed, upper jaws caved in and lower jaws shot away, but there is no time for any treatment except to prevent infection. With few exceptions the delicate rebuilding work must be entirely neglected. There is no time; no place.

"With a little help from you and other humane Americans thousands of these young men can be sent back into the world with nothing but a few scars to show. The committee has printed photographs showing these wounds before and after they have been treated by Dr. Morestin, the famous facial surgeon, who has been called 'the sculptor of human flesh.' It was decided that the 'before' were too frightful to be sent broadcast through the country, but if you desire, the person who sends you this appeal can arrange for you to see them.

"The greatest facial surgeons in the world have contributed their services to a hospital to be established in Paris for the treatment of these wounds. The French War Office has offered a suitable building. The American Red Cross will supply disinfectants, gauze, bandages, cotton and other hospital supplies. It has also given \$2000 in cash and may be of future assistance. For each \$20,000 the committee can establish and maintain one hundred beds. Even one hundred beds will do a great work. Five hundred will do wonders. Won't you help, if even only a little?"

The second of the two new special funds initiated in the United States is for the relief of soldiers blinded in the war. The appeal for subscriptions is issued by the British, French and Belgian Permanent Blind Relief War Committee, 590 Fifth Avenue, New York City.

"The first work of the fund will be to enlarge and modernize all the present blind institutions of Europe by means of financial donations, as well as assisting the work of Mr. Pearson in England, M. Vallery-Radot and Miss Holt in France. The fund later intends to organize in various European cities, additional modern well-equipped blind schools, blind workshops, blind employment exchanges and agencies for commercializing blind products, so that all this particular class of war victims may be saved from their present hopeless and helpless situation, and may be rendered self-supporting for life.

"Self-respecting, able-bodied, passing daily through a living death, these thousands of blinded war victims are being slowly killed, not by their injuries, not by starvation, but by the apparently permanent hopelessness of their situation. Six months' training, on the other hand, will educate each one of them in some trade not requiring sight. A single contribution of sev-

eral hundred dollars will go far to make one of these blinded soldiers self-supporting for life.

"The appeal is being sent to 120,000 people of prominence throughout the United States. The patronage of their majesties, the King and Queen of Great Britain, and the queen mother, Alexandria, as well as M. Raymond Poincaré, president of France, and King Albert and Queen Elizabeth of Belgium, has been obtained for the distribution of the appropriations from the fund in their respective countries.

"Mr. Pearson, the English newspaper proprietor, who is on the fund's executive committee, is now living at St. Dunstan's with 130 blinded soldiers and sailors, to whose rehabilitation he is devoting his life. This fund, although specifically organized to aid the blind of three nations, will ultimately contribute benefactions upon every blinded person throughout the entire world, its officials say. According to statistics, the world, a year before the war broke out, contained 2,500,000 blind. The number of blind who will be added to this total by the war cannot be estimated until years after the war itself is over."

EUROPEAN WAR NOTES.

WAR RELIEF FUNDS.—On May 13, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund.....	\$119,266.13
Allied Fund.....	98,322.61
French Wounded Fund.....	80,679.20
British Imperial Relief Fund...	55,324.31
Armenian Fund.....	39,132.76
Polish Fund.....	33,613.26
Facial Hospital Fund.....	16,818.00
Artificial Limbs Fund.....	7,272.00
Scottish Women's Hospital.....	1,308.80

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending May 13, there were 303 deaths reported, with a rate of 20.78 per 1,000 population, as compared with 266 and a rate of 18.53 for the corresponding week of last year. There were 42 deaths under 1 year as compared with 38 last year, and 94 deaths over 60 years of age against 75 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 45; scarlet fever, 41; measles, 277; typhoid fever, 0; whooping cough, 41; tuberculosis, 70.

Included in the above were the following cases of non-residents: Diphtheria, 7; scarlet fever, 11; measles, 2; tuberculosis, 10.

Total deaths from these diseases were: Diphtheria, 4; measles, 4; whooping cough, 2; tuberculosis, 34.

Included in the above were the following deaths of non-residents: Diphtheria, 1; tuberculosis, 5.

REOPENING OF BURRAGE HOSPITAL.—It is announced that during the current season, the Burrage Hospital on Bumkin Island is to be reopened for the reception of patients.

"Mr. Albert C. Burrage built this hospital, and opened it in July, 1902. It was planned for the reception of 150 or more patients. For several summers its work went on, but it was discontinued when Mr. Burrage decided to live on the Pacific coast. For the past few years, the city authorities have received permission to use the first floor as a shelter for the children, who were taken there on the Randidge Fund daily excursions.

"The island was a legacy to Harvard College, and, under the provisions of the deed transferring it to that institution, could not be sold. Mr. Burrage overcame that difficulty by leasing the island for 500 years, which, for all practical purposes, is equivalent to a sale.

"The building is absolutely fireproof in its construction. Not only is the building itself of non-inflammable material, but the steam and hot water plant is in a separate building some distance from the hospital. There are no elevators and the difficulty which would naturally attend the transfer of children, and particularly of crippled children, from one floor to another, was overcome by building two sets of runways, which connect the first and second floors and consist of a series of gradual slopes, instead of one flight of stairs. Wheel chairs may be safely propelled by the occupants from one floor to another with very little exertion, and without the slightest danger. The floors of the runways are covered with rubber matting, so that patients may readily make the ascent or descent on foot or with the aid of crutches, if necessary."

LEGISLATIVE NOTES.—In the Massachusetts General Court recently, the committee on public health voted to report favorably a resolve for the appointment of a special commission to investigate the use of habit-forming drugs in this state, and the need of more restrictive legislation.

The legislative committee on public institutions has voted to refer to the next General Court a resolve for the appropriation of \$1,000,000 for the construction of a new metropolitan hospital for the insane at Waltham, Mass.

"Although there is urgent need of building a school in Western Massachusetts for the care of feeble-minded, the Legislature has taken no action on the bills for the building which were filed early in January. The delay is due principally to the uncertainty as to whether the Board of Insanity will be reorganized. The bill for the reorganization has been reported and it is likely that the Committee on Public Institutions will act soon on the institution bills before it.

"Last year's Legislature made an appropri-

tion of \$50,000 for the purchase of land in the western part of the state for a third school for the feeble-minded. Early this year, the State Board of Insanity purchased 880 acres of land in Belchertown for the site. The bills now under consideration provide for an appropriation of \$150,000 annually for five years for the construction of buildings to house one thousand persons. If favorable action is taken, the State Board of Insanity will immediately begin to make plans for the structures.

"In a report just issued by the League for Preventive Work, the statement is made that there are approximately 12,000 feeble-minded in Massachusetts outside of State schools. The great majority of these, according to the report, are unprotected in the community, 'where their presence constitutes a problem so grave that on economic, as well as social grounds, the need for this immediate provision should be carefully considered.'"

SCHOOL CHILDREN IMPROPERLY FED.—A conference lasting two days was held early in May under the auspices of the Women's Educational and Industrial Union, to consider the question of the school lunch. Superintendent Dyer of the Boston Public Schools stated that, in his opinion, 50% of Boston school children are improperly fed, largely through the ignorance of mothers. He recently investigated the food of one thousand children in a by no means poor district, and found that 80% of them had coffee or beer twice a day. Superintendent Dyer expressed a wish that the serving of scientifically prepared lunches as now carried out in the high schools of Boston could be extended to schools of lower grade. Sarah Louise Arnold, Dean of Simmons College, spoke on "Popular Education as to Diet;" Dr. Percy Goldthwait Stiles, instructor in physiology in Harvard University, read a paper on the "Application of Standards to the Need of the Normal Child," and Edward F. Brown, executive secretary of the New York Lunch Committee, spoke in regard to the relation of economics generally and the school lunch problem. Other papers along this same line showed the importance of this subject and its relation to the ability of school children to get the most out of their opportunities in school.

INSTRUCTIVE DISTRICT NURSING ASSOCIATION.—The recently published thirtieth annual report of the Boston Instructive Nursing Association records the work of that organization during the year ended January 31, 1916.

"The treasurer's statement shows that since the last annual report the permanent funds have been increased by about \$73,000. Of this amount \$20,000 came from two legacies and the balance from the trustees of the Gwynne Temporary Home, to be used principally for the care of children. The net income for the year was \$67,385, and the expenses were \$70,378, leaving a

deficit of \$3,092, which was met by the balance on hand at the beginning of this year. The balance at the end of this year, \$3,866, may take care of next year's deficit, but something must be done to enable the Association to have more income, since the demands for the services of the nurses are increasing every year and consequently the expenses.

"The usual amount of \$290 was received from the trustees of the Mrs. Arthur T. Lyman fund. From this and the balance carried over from the previous year, \$348 was granted sick nurses, and \$167 was paid for the care of special cases. The balance of \$76 belonging to the Comfort Fund was expended during the year, and it would be a great help to the Association if it were replenished, as it is used to buy delicacies for deserving patients who would otherwise be denied them.

"The total number of patients during the year was 14,049; new patients, 13,003; total number of visits, 128,742; and parental visits, 9,301."

MASSACHUSETTS DENTAL SOCIETY.—The fifty-second annual meeting of the Massachusetts Dental Society was held in Boston on May 3, 4 and 5. The sessions were at the Copley-Plaza Hotel and the Forsyth Dental Infirmary. The introductory and annual addresses were made by Dr. Charles M. Proctor of this city, the retiring president, who spoke particularly of dental legislation, of recent progress in oral hygiene, and of the great impetus given to oral surgery by the European War. Other papers were presented by Dr. Joseph B. Hartzell of Minneapolis, Dr. Joseph M. Leav of New York, Dr. E. Melville Quimby, Dr. Justin E. Nyce of New York, Dr. Samuel H. Leslie of Fort Strong, and Dr. H. E. Frusell of Pittsburgh. The following officers were elected for the ensuing year: President, Dr. Harold W. Cleaveland of Springfield; vice presidents, Dr. Frank T. Taylor of Boston and Dr. George C. Ainsworth of Boston; assistant secretary, Dr. Albert W. Day of Worcester; treasurer, Dr. Joseph T. Paul of Boston, and editor, Dr. C. Edson Abbott of Franklin. The election of a secretary was deferred until a later session.

The Society now has a total membership of 848.

MASSACHUSETTS ANTI-TUBERCULOSIS LEAGUE.—The second annual meeting and conference of the Massachusetts Anti-Tuberculosis League, held in Boston on April 27, was attended by over 200 persons. The report of the secretary, Mr. Seymour H. Stone, stated that the league is now composed of 36 organizations.

"More Red Cross Seals were sold last year than ever before, the total being 2,231,877, a gain of more than 400,000 last year. After pay-

ing the Red Cross its share and deducting expense of state and local agencies there is left \$19,500 to be used in the fight against tuberculosis. Of this amount the league received \$1603.51."

The following officers of the league were elected for the ensuing year:

"Vincent Y. Bowditch, M.D., president; Walter P. Bowers, M.D., James C. Coffey, Rev. William B. Geoghegan, John H. Gifford, M.D., Mrs. Joshua Hale, Louisa P. Loring, Allan J. McLaughlin, M.D., George L. Schadt, M.D., vice-presidents; Seymour H. Stone, secretary; Arthur Drinkwater, treasurer.

"Roger I. Lee, M.D., Vanderpoel Adriance, M.D., Carl A. Allen, M.D., Herbert C. Clapp, M.D., Eugene A. Darling, M.D., Mrs. J. H. Folger, C. N. Hilliard, Mrs. W. H. Lothrop, Rev. P. J. McCormack, Robert Marden, Edward O. Otis, M.D., Rev. P. W. Perkins, Walter G. Phippen, M.D., Daniel L. Prendergast, Charles E. Prior, M.D., Miss Julia W. Redfield, Mrs. George Rice, Mrs. F. G. Rounseville, George B. Sargent, M.D., William S. Smart, Arthur K. Stone, M.D., Thomas N. Stone, M.D., Miss Caroline V. Tucker, Mrs. Charles O. Tyler, George V. Underwood, M.D., executive committee."

It is expected that the series of papers presented at this meeting will be published in a later issue of the JOURNAL.

Obituary

PROFESSOR LÉON LABBÉ.

The recent death of Professor Léon Labbé marks the close of an honorable career of a distinguished French surgeon. Professor Labbé was born at Merlerault (Oise) on September 29, 1832. He graduated at the Paris Faculty in 1861, became *agrégé* in 1863, and surgeon to the hospitals in 1864, and for more than thirty years he was one of the leaders of French surgery. His name was brought prominently before the public many years ago by his successful removal of a fork from the stomach of a man who had swallowed it; the case was known as that of *l'homme à la fourchette*. Labbé was the author, in conjunction with Coyne, of a treatise on benign tumors of the breast, and of a number of other writings on surgical subjects. He was a member of the Institute of France and a very active member of the Académie de Médecine. He was also a Commander of the Legion of Honor. Labbé retired from professional life in 1905 and entered the French Legislature, becoming Senator for the Orne and President of the General Council of the Department.

Miscellany.

CURRENT ACTIVITIES ON TUBERCULOSIS.

IN the issue of the JOURNAL for March 2, 1916, we commented editorially on the recommendations of the Massachusetts State Department of Health relative to the county care of tuberculates in Massachusetts and on a proposed bill embodying these recommendations. At a hearing on this bill held recently before the committee on public health, among many others appearing in advocacy of the measure, Mr. Seymour H. Stone, representing the Massachusetts Anti-tuberculosis League and the Boston Association for the Relief and Control of Tuberculosis, reported that there are at present between thirty and forty thousand tuberculous persons in this state, for only two-thirds of whom adequate care is provided.

"In France it has been proved that from 95 to 98 per cent. of the people have tuberculosis in some degree. Hospitals as proposed would be better than the state sanatoria, because advanced cases will not stay at the latter, but will stay at local institutions. Two or three months are now wasted before an applicant can be admitted to a state sanatorium. The state is from 1500 to 2200 beds behind the needs of the public."

Others who advocated the measure were Dr. Francis H. Slack, secretary of the Massachusetts Association of Boards of Health, Dr. Charles E. Perry, superintendent of the Hampshire County Hospital for Tuberculosis, Dr. Everett M. Bowker of Brookline, Dr. Francis P. Denny of Brookline and Dr. Eugene R. Kelley of the Massachusetts State Department of Health. Dr. Perry reported particularly the success of the county institution at Northampton.

"Patients come from the large and small towns in about the same proportion. Northampton, having one-third of the population of the county, furnishes one-third of the inmates. Every dollar which is spent in the treatment of tuberculosis in this way saves many dollars in the future. Expenses are about \$11 a week per patient and the institution costs about \$50,000. The people of the county are well satisfied with it."

The Boston Association for the Relief and Control of Tuberculosis in its recently published twelfth annual report, comments particularly on the review of the work which it has done during the past year in the control of tuberculosis in Boston, where 1264 persons died of the disease during 1915.

"The coöperation of the Association with the Boston Consumptives' Hospital department and the Maverick dispensary in East Boston has resulted in the examination of many persons in

East Boston who might not have gone to the central dispensary in Boston.

"The Association has also made a special study of conditions causing tuberculosis in another section of the city with the hope that citizens interested in the welfare of this section will take the necessary steps to have these conditions bettered.

"Twenty-three legislative bills have been considered by the legislative committee and the Association has been actively interested in having the Department of Health placed under a single commissioner.

"The educational work of the Association has consisted of lectures and the distribution of about 60,000 pieces of literature. A new enterprise participated in by the Association, in coöperation with nine other agencies, was the giving of motion pictures and stereopticon entertainments on health subjects in the parks and playgrounds of the city last summer. These shows were very popular, it being estimated that during the four weeks they were seen by about 125,000 people.

"A conference on 'Communicable Diseases and Their Relation to the Handling of Food' resulted in the appointment of a new committee on health in industry, with a paid secretary. This committee has been working to establish graduate nurses in manufacturing and mercantile establishments, the Association believing that it is economy for an employer to conserve the health of the employees.

"Prendergast camp, maintained by the Association, has during the year cared for a total of 94 patients. Most of these were obliged to wait two or three months before being admitted to a state sanatorium and the life at camp during this interval helped to prevent their condition from becoming worse.

"In 1903, when the Association first began its work, the death rate from tuberculosis was 23 per 10,000 inhabitants. Last year this rate was reduced to 17. But there are still 100 deaths every month from the disease, in this city, and the need, therefore, to support an organization of this kind will be urgent for some time to come."

ANNUAL REPORT OF PUBLIC HEALTH SERVICE.

IN the monthly bulletin of the Massachusetts State Department of Health for January, 1916, appears an admirable review of the recently published annual report of the Surgeon General of the United States Public Health Service for the fiscal year 1914. This report deserves a perusal in full by physicians and all others interested in public health matters. A summary by the State Health Board deserves republication as a synopsis of the material in question:

"The annual report of the surgeon-general of the United States Public Health Service records the largest amount of work performed in the history of that organization. Since the passage of the law of 1912 the public health functions of the service have materially broadened, thereby increasing greatly its usefulness to the American people. Throughout the report the economic importance of disease prevention is made apparent to the reader.

"Perhaps the most important achievement of the year was the discovery that pellagra is a deprivation disease, resulting from a faulty diet containing an excess of carbohydrates. While the final experiments which led to this discovery have only recently been completed, the conclusion itself is the culmination of investigations extending over a period of seven years. The work has consisted of epidemiological field studies, actual feeding experiments conducted at numerous places in Georgia and Mississippi, and experimental research at Spartanburg, S. C., and other places.

"A new national quarantine station was opened at Galveston, Texas, and the control of the Boston station was transferred to the Public Health Service. A great reduction in immigration has been observed during the year, with a corresponding increase in the number of aliens certified. At the port of New York the percentage has risen from 2.29, previous to the development of the European conflict, to 5.37 since that time, this increase largely being due to the fact that with the decreased immigration more time can be devoted to the examination. The number of cases treated at marine hospitals and relief stations exceeded 55,000, 15,000 of which were hospital patients, a considerable increase over previous years. The coast guard cutter *Androscooggin* was fitted out as a hospital ship, and now affords relief to deep-sea fishermen on the Banks of Newfoundland.

"On the occurrence of plague at New Orleans, the first outbreak upon the Gulf seaboard, the State and local health authorities requested the Public Health Service to take charge of the situation. Extensive rat-proofing and other antiplague measures were undertaken, resulting in the eradication of the disease from among human beings, and the practical extermination of the rodent infection.

"Great reduction in the incidence of malaria was obtained in localities where surveys were conducted. Drainage projects, rice culture studies and the conditions surrounding the impounding of water for power purposes were investigated in order to eradicate as far as possible the disease in these areas. Scientific investigations of malarial infection showed that in the latitude of this country the most important agent in carrying the infection through the winter season is man, and not the infected, hibernating *Anopheles* mosquitoes, as was previously supposed. From the standpoint of prevention this is a discovery of considerable value.

"Studies of occupational diseases and industrial hygiene were instituted at several places during the year. A survey of the industries of Cincinnati was made to determine the cause of the prevalence of tuberculosis among industrial workers. The investigations relating to the migration of persons suffering from tuberculosis were completed.

"Upon the request of the health authorities of five states the organization and operations of the respective boards of health were studied and recommendations advanced for improvement in the powers and duties of these bodies. The health organizations of several cities were likewise investigated.

"Investigations of the pollution of streams and the examination of shellfish were also conducted.

"Trachoma was combated in the Appalachian Mountains, where it is most prevalent, over 12,000 cases being treated. Surveys in certain states during the year showed that the disease is not an uncommon infection.

"Rural sanitation work was conducted in six different states, and everywhere resulted in the reduction of typhoid and other communicable diseases.

"Public health laboratories for the prevention of the interstate spread of disease were established at Chicago, Seattle and numerous other railway centers.

"Additional duties have been imposed upon the service by extension of relief benefits to the newly organized coast guard and the physical examination of seamen applying for the rating of 'able seaman.' For this reason, and because of the greatly increased health functions of the service, an increase in the commissioned personnel is recommended. An additional building for the hygienic laboratory and the establishment of a national leprosarium for the proper segregation and care of cases of leprosy are also recommended."

INCREASE IN COST OF DRUGS.

THE continued increase in cost of drugs owing to the conditions of the European War has been even more marked during the past month than in the six months preceding. Report from New York on February 14, notes in part as follows the extent of recent advances in certain of the more important drugs.

"Urgent export inquiries for all kinds of narcotic drugs from the European battle fields have again prompted importers and derivative makers to advance their quotations for opium in all forms. An advance of 50 cents per pound has been named, bringing quotations for druggist's quality gum containing 11 per cent morphia and

over, to \$11.50 per pound, while powdered and granular grades have been raised to \$13 per pound. The receipts of opium from Turkey have practically ceased, but small supplies are being received occasionally from Russian Macedonia.

"Sharp advances have been named on acetanilid, which has been advanced 15 to 25 cents per pound and is held for \$1.40 to \$1.50 per pound.

"Quinine and its salts have held relatively steady within the range of \$1 to \$1.15 per ounce in second hands, and makers of domestic salts have continued to hold their output very firmly on the basis of 75 cents per ounce for the sulphate in 100-ounce tins. The epidemics of grippé and other diseases attributable to unhealthy weather conditions have been a material factor in increasing the volume of domestic business, while export demand from South America and other countries has also reached large proportions.

"The most significant development in the quinine situation at the moment is the inauguration of an upward movement by Philadelphia holders who have raised prices to \$1.25 an ounce. Advice from Amsterdam, Holland, have been received telling of an advance of more than 50 per cent. in prices for cinchona bark at auction where 121,398 kilos of pharmaceutical bark were offered on Jan. 20 last.

"All previous price records for mercurials were again broken on Feb. 8, when domestic manufacturers were compelled to advance their prices owing to the shortage of quicksilver. An advance of 60 to 75 cents per pound was named in all hard mercurials, calomel having advanced 70 cents to \$3.43; corrosive sublimate, granular and powdered, 60 cents to \$3.03 and \$3.08; mercury bisulphate, 60 cents to \$3.04; red precipitate, 75 cents to \$3.68 and \$3.78; and white precipitate, 75 cents to \$3.78 and \$3.83 per pound. The "soft" mercurials were advanced 30 to 50 cents per pound, the new figure for U. S. P. blue mass being raised 35 cents, to \$1.70 per pound; blue pills powdered, 35 cents to \$1.72; mercury and chalk, 35 cents to \$1.72; mercurial ointment, "1/2", 50 cents to \$2.03; mercurial ointment, "1-3", 30 cents to \$1.73 per pound, and citrine ointment, 35 cents to \$1.70 per pound. The above quotations apply to any one kind of assorted preparations in lots of 50 pounds or over, an advance being charged for quantities less than 50 pounds.

"Importers of Norwegian cod liver oil are advising the pharmaceutical trade of the acute situation prevailing. A limited quantity was offered at \$85 and \$90 per barrel recently, but prices have now jumped to \$100 per barrel of 30 gallons. The recent conflagration in Bergen, Norway, destroyed a large part of the available supplies. No offers of any importance are coming from abroad and the market in this country is nearly bare of stocks. As it will be nearly three months before any new lots from the 1916 catch can arrive in this country, it is certain

that prices will remain high for some months to come. Newfoundland cod liver oil is finding its way here when consigned to the British consuls at New York or Boston, and quotations for this oil in 30 gallon barrels now range from \$70 to \$73 per barrel, an advance of \$2 to \$5 over previous quotations.

"The shortage of coal tar drugs and medicinal preparations has become more acute than ever. Manufacturers who promised to come to the relief by the end of January, have evidently miscalculated, for prices have touched the highest levels yet recorded. Carbolic acid, the base product, has been advanced by manufacturers to a basis of \$1.39 and \$1.52 per pound for pound bottles, though drums of 280 pounds are being offered by largest manufacturers at \$1.25 and \$1.30 per pound. Spot stocks of phenolphthalein are reported practically cleared and prices have jumped to \$20 and \$22 per pound; acetphenetidin has been advanced from \$16 to \$22 per pound, antipyrine to \$50 and \$60 per pound; saccharine to \$12 and \$13 per pound; aspirin to 90 and 95 cents per ounce; benzoate of soda, salicylic acid and salicylate of soda to \$4 and \$4.25 per pound; artificial oil of mustard to \$15 and \$17 per pound; synthetic wintergreen to \$3.25 and \$4.25 per pound and artificial oil of almonds to \$5.50 and \$6.

"Increased costs of production of Rochelle salts, Seidlitz mixture, cream of tartar, tartaric acid and tartar emetic, have resulted in fresh advances in these products of 3/4 cent to 2 cents per pound.

"Wood and denatured alcohol have been raised 5 cents per gallon by domestic distillers owing to the heavy export orders in the market, and wood alcohol is now held at 62 and 67 cents per gallon and denatured at 55 and 59 cents per gallon.

"Stocks of German and other European proprietary medicines and patented concoctions are fast becoming exhausted in this country and disappearing entirely from the market. In this connection it is interesting to note that in a large number of cases foreign manufacturers of drugs, proprietary nostrums and medicinal and industrial chemicals, are either establishing or enlarging branches in this country in anticipation of action by Congress looking to the more rigid exclusion of foreign articles of this kind which come into competition with goods made in this country.

"The situation obtaining in all crude drugs of European and foreign origin has become more tense than ever. Belladonna leaves have advanced to \$1.50 and \$1.75 per pound and sellers now state that the supplies in this country are insufficient to supply the needs of the trade. Offers of Russian cantharides have been withdrawn by some sellers owing to the stoppage of imports en route from Russia."

A further report from New York on February

26 noted a continued advance in the price of all fine medicinal chemicals.

"Quinine has been holding relatively steady on the basis of \$1 per ounce in second hands, and 75 cents per ounce for bulk in manufacturers' hands. An order for 600 kilos or more than 21,000 ounces has just been received from Brazil, South America. The market strengthened on the receipt of this order and some holders raised their inside figures to \$1.10 per ounce.

"The market for medicinal coal tar products has touched new high record trading levels within the past few days following the stronger position of carbolic acid, which has been advanced 10 cents per pound by some sellers to a basis of \$1.35 and \$1.50 per pound in drums. Acetanilid, utilized in all headache powders and in other proprietary articles, has risen 50 to 60 cents a pound within the past few days and is now selling at \$1.70 and \$1.75 per pound on spot. There have been comparatively heavy export orders in the market within the past week and these have been filled at \$1.70 per pound. Phenolphthalein has also been advanced sharply and is now only obtainable at \$22.00 per pound against \$20.00 a few days ago. Aspirin continues in urgent request from all parts of the country and spot lots are selling for 90 to 95 cents per ounce, against manufacturers' quotations of 65 cents per ounce.

"Extensive purchases are still reported in the local drug and chemical market of narcotics, anesthetics, anodynes, analgesics and disinfectants as well as numerous crude drugs and medicinal preparations, by foreign consumers, and these are offsetting whatever falling off there has been in domestic business due to high prices. Cocaine is in urgent demand for legitimate usages. There is no shortage of coca leaves but makers of cocaine have already signified their intention of advancing the existing schedule price of \$3.75 and \$4 per ounce for the hydrochloride, owing to heavy orders now in the market.

"Strychnine is in much the same position as cocaine. The basic material, nux vomica, has just advanced to 7.5 and 8 cents per pound for the whole button, while the powdered has registered another uplift of 11 and 12 cents per pound. Demand for strychnine has been heavy and makers are expected to advance their schedule within the next few days. A generally higher plane has also been reached by practically all other crude drugs of Far East origin at the close of the week. Among essential oils East Indian sandalwood had risen to \$7.25 and \$7.75 per pound and West Indian to \$2 and \$2.25 per pound.

"The chief developments in the botanical drugs have included advance in colchicum root to \$1.10 per pound and the limiting of offers to less than 100-pound lots; the advance in select licorice root, owing to scarcity of the Spanish grades, to 20 cents per pound and in the ordinary root to

18 cents per pound; the advance in high dried rhubarb root to 19 and 45 cents per pound, in white squills root to 12 cents per pound; and the stronger position of all varieties of valerian root as well as gentian, couch grass, Jamaica ginger, and elecampane roots. Henbane leaves of Russian and German extraction were in short supply and prices have been raised to 75 and 90 cents per pound as to quality. All of the various descriptions of senna leaves, wintergreen leaves and sage, thyme and buchu have also enjoyed a wide demand at somewhat higher prices.

"Changes have been so rapid and precipitous that it has been impossible to post buyers accurately. Many values are today merely nominal and are fixed at random by whoever happens to hold the stocks. Speculation continues intense, many re-sale lots exchanging hands half a dozen times in the course of a day's trading operations. The situation has been further complicated by reports from the Far East which indicate that Great Britain has imposed additional embargoes as well as increased export duties on many drug and spice products. Cablegrams from Lyons received yesterday indicate that the French Government has prohibited all future exports of Belgian products. This will have a material effect on valerian roots, chamomile flowers and various other botanical drugs which had been arriving here."

Further report from New York on March 14 states that speculative operations in the wholesale drug and chemical markets have still further continued the general rise in prices described above. Many coal tar medicinal drugs and vegetable alkaloids have disappeared from the market and physicians have been obliged to discontinue prescribing certain high-grade foreign goods now virtually out of stock in this country. The result of compulsory substitution has created an abnormal demand for certain other drugs hitherto having but a small market or being unaffected by the general rise in prices.

"A sharp advance in price of metallic bismuth in the London market to a basis of 11s. per pound prompted domestic manufacturers of bismuth salts to raise their prices to the highest point of the year. The revised quotation, March 8, for metallic bismuth in manufacturers' hands was \$3.15 and \$3.25 per pound, but second hands were securing all the way from \$6.00 to \$7.00 per pound for small lots from store.

"Predictions of advances in strychnine and its salts and in cocaine have been realized within the past week, export inquiries having become more numerous. The market for strychnine is 10 cents an ounce higher all round, manufacturers having raised their quotations in 100 ounce lots. For eight ounce vials an advance of 25 cents is exacted. The market for cocaine was likewise subjected to a precipitate advance amounting to 50 cents an ounce, owing to the heavy demand from export and domestic channels. The muriate or hydrochloride is now being

quoted by the manufacturers on the basis of \$4.25 per ounce for bulk; \$4.30 per ounce for 1 ounce vials.

"A fresh upward movement also has occurred in all medicinal preparations of potash owing to continued scarcity and high cost of muriate of potash, which is still practically unobtainable in less than small lots under \$500 per ton. The most conspicuous advance was in iodide of potash which was raised to \$4.30 and \$4.35 per pound in bulk lots of 50 pounds or more. The market for red prussiate of potash which had been hovering around a \$7.00 per pound basis, reacted somewhat when offers were made on a \$6.00 pound basis, but all other technical compounds of potash have touched new high record trading levels. The market for nitrate of potash or saltpetre is still nominal, owing to the heavy demand from the ammunition manufacturers, and spot quotations are given at 38 to 40 cents per pound.

"Among medicinal acids the features included an advance of 20 cents by manufacturers over their previous schedules on pyrogallol acid. The medicinal tannic acid which is being made only by a few chemical manufacturers was also raised 10 cents a pound.

"All tartar products registered sharp advances in second hands. Tartaric acid crystals U. S. P. have advanced to 72½ and 75 cents per pound, while the powdered are being held at 65 to 70 cents per pound.

"Constantly advancing prices for denatured and wood alcohol prompted formaldehyde manufacturers to raise their quotations on March 8 to a minimum basis of 10½ and 12 cents per pound in barrels and 11½ and 12 cents per pound in carboys. This was an advance of 2 cents per pound and marked the first uplift of any importance in this product which had occurred since the outbreak of the European War. The advance of formaldehyde brought with it sympathetic advances in preparations of this disinfectant.

"Among the medical group of coal tar chemicals, acetanilid prices have risen 25 to 50 cents per pound to a minimum basis of \$2.25 and \$2.50 per pound in second hands against a manufacturer's quotation of \$1.65 and \$1.75 per pound. Antipyrine has practically disappeared from the market and only pound and ounce lots appear to be obtainable from second hands and for such quantities \$64.00 to \$65.00 per pound is being asked. The situation in acetphenetidin is almost identical. The market for aspirin has broken through the \$1.00 an ounce basis, according to some sellers, and even higher prices are predicted in view of the protracted shortage of aceto-salicylic acid.

"Among fixed oils the most prominent development has been another wild upward movement in the market for Norwegian and Newfoundland cod liver oil. Cablegrams received on March 10th indicated that the total produc-

tion of Norway to February 22 had been only 3,364 barrels which contrasted with 5,551 barrels on the corresponding date a year ago. Hence sellers here raised their prices to \$135 per barrel for Isdahl's oil. The market for Newfoundland cod liver oil moved up in sympathy with the rise in Norwegian grades and the inside quotation for Munn's was raised to \$85.00 per barrel, an advance of \$10.00. The trend in other fixed oils also has been generally upward. There has been no relief from the scarcity of castor oil and prices are fully 5 cents per pound higher, ranging today from 24 to 25 cents per pound for the standard to crystal grades.

"A wild flurry has taken place in glycerine following the British Government's embargo on shipments of palm oil. American makers of the crudes and distillers of the chemically pure grades have advanced prices sharply.

"Quicksilver prices having declined \$50 per flask of 75 pounds to a basis of \$250 to \$260 per flask following larger receipts from California as well as a few isolated consignments from Europe. There has been no corresponding decline in quotations for mercurials. Another exception to the general upward movement in prices for nearly all drugs and chemicals has been the lowering of views of second hands on quinine. This drug is now obtainable from resellers at 90 cents per ounce in a large way, and it is intimated that even this figure could be shaded on a large order. Hydrogen peroxide has likewise been subjected to a sharp downward revision, as manufacturers have been receiving more liberal supplies of barium dioxide.

"Growing shortages of practically all foreign botanical and quasi-botanical goods have also resulted in sensational uplifts in prices. A precipitate advance from 55 cents per pound to \$2.00 per pound has taken place in cut althea root. Aconite root has advanced from 18 and 20 cents per pound to 50 cents a pound; select licorice root from 20 to 25 cents per pound; arnica flowers from 60 to 80 cents per pound; Hungarian chamomile flowers from 50 cents to 65 and 70 cents per pound; celery seed to 35 and 36 cents per pound; Belgian valerian root to 65 cents per pound; powdered and ground rhubarb root to 22 and 45 cents per pound; genuine dog grass root to 95 and \$1.05 per pound; hellebore root to 45 cents per pound; colchicum root to \$1.25 per pound; chincona bark with total alkaloids of 7.48 to 30 cents per pound; while henbane leaves measuring up to the U. S. P. requirements have been advanced to 90 cents and \$1.00 per pound, and belladonna leaves to \$2.00."

The extreme rise in price of certain important and frequently used drugs, such as aspirin, salvarsan, potassium bromide, has led in some instances to the substitution of inferior or spurious articles on the market at lower prices. Early in the year the cities of Savannah and Wilmington, in the South, and San Francisco and Port-

land in the West, were flooded with spurious aspirin and salvarsan.

"The spurious goods also made a general appearance in the eastern markets and a general complaint has gone up from unsuspecting buyers who complain that a small lot purchased from a retail drug store will usually contain one or two genuine aspirin tablets, while the balance will be made up of unstamped tablets, which have often proved actually harmful."

"The infringement of the German patents on salvarsan and neo-salvarsan, otherwise known as '606', by Canadian proprietary manufacturers and the flooding of the Western markets on the Pacific coast with supplies of the spurious goods has already met with serious consequences, according to San Francisco advices which state that eleven sailors met their death through administration of spurious salvarsan. The endeavor to locate the actual sources of supply have thus far proved futile.

"New York representatives of Canadian drug houses are aware that attempts to duplicate salvarsan have been made in Canada, but they deny that any of the goods have reached the eastern United States seaboard. One interest in close touch with the situation says:

"The patents on salvarsan and neo-salvarsan are public property and copies of them can be obtained by anyone who will send 25 cents to the United States Patent Office. The secret in the manufacture of salvarsan does not lie so much in a knowledge of what the constituent elements of the drug are as in the knowledge of the secret process of compounding. So far as we are aware, no Canadian manufactured salvarsan has ever found its way on the market in New York, but we do know definitely that considerable quantities of the genuine German goods have been smuggled from Denmark and have been disposed of here at fancy prices."

"Substitutions have not by any means been confined to the retail end of the drug business. Non-scrupulous dealers have sprung up like mushrooms with the advent of intense speculation and thousand-fold inflated war prices.

"A striking example of the length to which some hawkers of questionable articles will go was recently furnished when one buyer who purchased several barrels of bromide of potash worth \$5.50 per pound, found on receipt of his goods that he had been shipped ordinary refined sugar instead of the bromide of potash. The substitution in this case was accomplished with skill and simplicity, the only deceptive requirements of the shipper having been the original containers and markings of some legitimate chemical manufacturer. Bromide of potash and refined sugar are nearly identical in appearance and the fraud was discovered only when the consumer endeavored to use the sugar in the preparation of a pharmaceutical product. The loss to the buyer is evident, refined sugar being

worth about \$15.00 per barrel while bromide of potash is worth \$5.00 per pound.

"Other evidences of the steps to which unscrupulous dealers will go to make capital out of the existing unprecedented conditions in the drug market are not wanting. The ban on the illegitimate usages of narcotic drugs through last year's enactment of the Harrison anti-narcotic law has by no means shut off the backdoor sources of supply. Much to the surprise of Government officials and manufacturers themselves, illicit trafficking in cocaine, morphine, heroin and even opium itself continues. One of the leading New York manufacturers of narcotics has kept a constant vigil on factory employees in the endeavor to discover a leak which has uninterruptedly accounted for more than 10% of his total output for more than ten years back. It was found that a trusted employee had been conducting a steady business in the stolen goods with outsiders. It was also found that stocks of narcotic drugs had been stolen from delivery wagons. These sources of supply for illegitimate drug trafficking have now been closed up, but new schemes for illegitimately procuring the goods are constantly recurring and manufacturers are at a loss how to lock effectually the stable door."

All these practices are, of course, in flagrant violation of federal law, and will be summarily suppressed or dealt with in such manner as to protect the market, the profession and the public.

Further report from New York on March 23, announced a continued advance in the cost of quinine.

"Advices from Amsterdam, Holland; state that Dutch makers have disposed of their entire production of quinine salts for 1915 at private terms, and that the output for 1916 also has been sold ahead at secret prices. The situation in quinine is further emphasized by cable advices from London, reporting a decrease of 83.5% in the total holdings of quinine on Jan. 31 last, as compared with a year ago, and 167% as compared with the holdings in 1911. The present stock of 1,441,488 ounces represents Dutch and German brands, whereas all English make is contracted for ahead to the government. With most London dealers and exporters refusing to handle German brands, and the Dutch makers having sold their production for this year ahead, no replenishment is in sight in this country, and indications now are that a sharp upward movement will be seen as soon as some of the weak holders have been eliminated.

"While demand for quinine is only fair in the local market, there is now a stronger undercurrent and second hands are reluctant to sell below 85 cents an ounce, as compared with a manufacturer's price of 75 cents an ounce. The further cable advices from London reporting an advance of 100% in the price of cinchona bark,

the principal source of quinine, also are affecting the situation in the drug.

"Among other new high levels touched in the drug and chemical market within the past few days are included a sharp advance in benzoic acid from toluol to a basis of \$7 per pound, comparing with a previous quotation of \$5 to \$5.50 per pound. This advance is based on the high cost of toluol and the small domestic production of benzoic acid. All of the metal chemicals are also considerably higher."

Further report from New York on March 30 states that although there has been a decline in the output of carbolic acid during the past year, so that its cost and that of its derivatives is steadily rising, there has been a definite decline recently in the price of camphor, cod liver oil and quinine.

"A late cablegram received from Christiania, Norway, yesterday, gave a more encouraging report on cod liver oil supply. The yield up to last week was but 20,895 barrels, but this week's cablegram reports an actual yield of 27,991 barrels of oil. The comeback of the Norwegian industry is attributed to the fact that production this year is exceedingly large when compared with the catch. Market quotations for Norwegian cod liver oil still range from \$120 to \$150 per barrel in the local market, while the Newfoundland oil has just been advanced from \$90 per barrel to a minimum of \$115 per barrel, owing to increasing scarcity.

"South America also has been in the market for quinine within the past two days, an order for 4000 ounces having been received from Latin America. No important domestic demand, however, is noted for this product, which is still being quoted at 80 to 85 cents per ounce by second hands and 75 cents by manufacturers. Other developments of an important character include an advance of 3 cents per pound in tartaric acid, an advance of $1\frac{1}{2}$ cents in cream of tartar, an advance of 25 cents in acetanilid, to \$2.75 per pound, and an advance in resorcin to the new high record figure of \$25 a pound, a rise of \$5."

Further report from New York on April 1 announced a few additional changes in price since the previous communication.

"Among the prominent revisions was an advance in citrated caffeine to \$8.50 per pound, and an advance in Newfoundland cod liver oil to \$120-\$125 per barrel. Opium, quinine and codeine were reported in moderate demand, and prices showed no weakness. An increase in the supplies of Russian isinglass resulted in a decline to \$6.50 and \$7.50 per pound, but Russian cantharides were in limited supply and not obtainable under \$8.50 and \$9."

Correspondence.

THE STUDY OF THE INTERNAL SECRETIONS.

Mr. Editor: The increasing appreciation of the importance of the glands of internal secretion and their influence upon the etiology as well as the treatment of any disorders, has made the subject of unusual interest to many physicians. It has been suggested recently by several American physicians that it might be well to form an *Association for the Study of the Internal Secretions*; and it is desired to know whether there is sufficient interest in this matter to warrant its further consideration.

A few of the prospective advantages of such an association would be: (1) The assembling of those with a mutual fellowship of interest in this subject; (2) Facilitating the exchange of ideas, inquiries and reprints on the internal secretions; (3) Enabling those who are interested, but do not have the facilities, to keep in touch with the articles that are appearing on this subject so frequently, but in such scattered and inaccessible periodicals—perhaps a monthly list of these articles with a brief résumé of their contents eventually might be prepared; (4) Facilitating concerted clinical study of the subject and the measures being brought forward in organotherapy.

No effort has yet been made to form such an association; but any physicians who are interested and would welcome the establishment of a community of interest embracing some or all of the points just mentioned, as well as others which cannot be enumerated for lack of space, are requested to send their names and addresses on a postal card to the undersigned at 715-19 Baker Detweiler Bldg., Los Angeles, Cal.

HENRY R. HARROWER, M.D.

SOCIETY NOTICE.

THE NEW ENGLAND HOSPITAL MEDICAL SOCIETY will meet at Boston University, 688 Boylston Street, corner of Boylston and Exeter Street, Boston, Thursday, May 18, 1916, at 8 P.M.

Subject: "How Can the Women of the Medical Profession Help the Navy and the Army in Preparedness?" by Dr. N. J. Blackwood, Medical Inspector U. S. Navy, and Col. Frank A. Graves, 8th Massachusetts Infantry.

ANNA O'SULLIVAN, M.D., *Secretary.*

RECENT DEATHS.

DR. WILLIAM H. HOYT, a retired physician residing in Wenham, Mass., died at his home on May 3, at the age of 54. He was born in Northfield, Vt., and graduated from the Medical Department of the University of New York in 1886. He settled in Sioux City, Ia., and continued in practice in this city for twenty-five years. He leaves a widow, his mother, a brother, Dr. S. M. Hoyt of Omaha, Neb., and a sister.

DR. JOSEPH ROWE WEBSTER, a retired Fellow of the Massachusetts Medical Society, died at his home in North Lexington, Mass., May 9, aged 82 years. Dr. Webster was a native of Milton, Mass., where he was born Nov. 3, 1833. Entering Harvard College he graduated eighth in his class in 1854, and he received his M.D. from the same university in 1859. In this year he joined The Massachusetts Medical Society from Milton, subsequently practising in Natick, Dorchester and Cambridge, Mass., living in the last city from 1898 until 1914. He was retired in 1908. He was a member of the Phi Beta Kappa, the Botanical Club, and the Boston Society of Natural History. He is survived by two sons and two daughters.

The Boston Medical and Surgical Journal

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Address.

PEDIATRICS AS A SPECIALTY IN THE SMALLER CITIES.*

PRESIDENTIAL ADDRESS.

By ALEXANDER C. EASTMAN, M.D., SPRINGFIELD, MASS.

ALTHOUGH pediatrics is still young as a specialty, it can no longer be questioned that it is a specialty. The only questions that arise for our consideration are the type of specialty and the place for its practice.

Most of the specialties, as ophthalmology, otology, laryngology, surgery, neurology, and also dermatology, and roentgenology, are so distinctly separate from general medicine that they have been recognized by the laity as distinct specialties, and are thus demanded as such in small cities and even the larger towns.

The close relationship of pediatrics to general medicine, puts it, however, together with obstetrics, in a class by themselves, in that they require, especially in their connection with general medicine, special study and training in order to be properly practised. We are early taught in the medical schools to look upon diseases of certain organs as distinct specialties, and diseases of other organs as potential specialties, or, in other words, branches of general medicine in which a physician may become more interested and hence more skilled. Pediatrics is neither of these; it deals with a certain large

proportion of the human race, whose diseases, mode of life and hygiene differ materially from the adult life, and therefore require a different point of view in their treatment, both in health and disease. A physician in general practice can treat children, if he first acquires, or inherently has, this different point of view; without it he cannot succeed in the practice of pediatrics. But even if so equipped it is impossible for the general practitioner to give the time to the small details necessary for the proper scientific treatment of children,—hence the specialty.

In considering the relationship of this specialty to the smaller city our first question is, What constitutes a small city? It is not mere numbers; it is, rather, the lack of special medical equipment. Medically a large city may be defined as one well equipped with medical schools and special hospitals, thus making it a definite medical center. A small city may, therefore, be defined as one lacking in these two factors. A city of 50,000 may be so isolated from any large medical center, and also have a sufficient consulting field to draw from, that it becomes a logical place for the practice of a specialty; again a city of 150,000 may be so overshadowed by a large medical center that the practice of a specialty, such as pediatrics, would be a dubious venture. It seems to me that in the present stage of pediatrics as a specialty, it is necessary, in considering a small city in which to practise the specialty, to select one sufficiently isolated that it may not be overshadowed by a large medical center, and at the same time have a good surrounding consulting field. In such a community then, how does the

* Read at a meeting of the New England Pediatric Society, held at the Boston Medical Library on January 7, 1916.

practice of pediatrics differ from that in the large city?

It is needless to say that any specialty can be, and should be, practised in the large cities, which through their special hospitals and medical schools, have become medical centers. It is under such ideal conditions that a specialty can grow to its best possibilities, and it is to the men working in such ideal surroundings that we look for the scientific advancement of the specialties. Rare and interesting cases may, of course, occur in communities far distant from medical centers, but without the equipment and surrounding of these centers it is often impossible to obtain the best results and learn the most from these cases.

The fundamental difference between medical practice in a large city and in a small city is in the type of practice. In the large cities the specialists may safely be said to outnumber the general practitioners, whereas in the smaller cities the general practitioner is still in the majority. It is in this latter fact that we find the chief difference between the practice of pediatrics in large medical centers and in the smaller city. The diseases of children have always constituted a large proportion of the general practitioner's work, and naturally he dreads the possibility of losing that work. Our problem becomes, therefore, the relationship of the pediatricist to the general physician.

Owing to the large percentage that children constitute in the general physician's practice, the pediatricist must, of necessity, come in daily contact with the family physician, and he is obliged to become very circumspect in defining the limits of his specialty. The general physician may be glad to turn over a feeding case to the specialist, but at the same time be very loath to give up a case of bronchitis. For this reason, although infant feeding and its problems constitute a large part of any pediatrician's work, it is especially true in the smaller city, where he may even be known by the laity as the specialist for babies rather than for children.

Because of the large educational propaganda concerning child welfare, people are demanding, more and more, special training in the physician who cares for their children. This is daily making the chance for the pediatricist's success much greater, but it is also complicating his relationship with the general physician. I think it can safely be said that no specialty requires more tact and patience in this respect than pediatrics.

Of necessity much of the work in the smaller city must be clinical in character, the scientific research work coming to us from the medical centers. The educational work, however, is just as important, and should be carried on just as thoroughly in the small as in the large city. Pediatrics is primarily a specialty of preventive medicine. Our chief aim is to produce healthy

babies, healthy children, and thus healthy adults. This necessitates a keen interest in municipal health problems. Proper housing conditions, the securing of clean milk from tuberculin tested cows, milk depots, instruction of mothers, the nursing and oversight of mothers during pregnancy, summer camps for babies with their mothers, playgrounds, schools, both the buildings and curriculum, conditions in the factories and stores as they relate to mothers and children, hospitals equipped to care for babies and children, and the instruction of nurses, especially as to the proper care of babies: such are some of the problems which will come to us, and should require our active interest. Altogether the specialty covers a broad field, and there is a place and need for the pediatricist in the smaller city.

Therapeutic and Preventive Medicine.

THE MANAGEMENT OF GONORRHEA.*

By J. DELLINGER BARNEY, M.D., F.A.C.S., BOSTON.

[From the Genito-Urinary Department of the Massachusetts General Hospital.]

In discussing the management of gonorrhea, I shall draw largely from our experience in the genito-urinary clinic at the Massachusetts General Hospital, where for some years we have undertaken the intensive study of this infection in men, women and children. I shall weave into my remarks certain observations which close contact with a large amount of clinical material has made justifiable, but which you will find differ from generally accepted beliefs and from what the text-books have taught. While it is obviously impossible to cover the entire subject in the scope of this paper, there are certain points on which I wish to lay special stress, and which, as general practitioners, you may find of value in your daily work.

The vaginitis of little girls and babies is astonishingly common. In most the gonococcus can be eventually demonstrated, but often only after many smears, stained by the Gram method, have been examined. Even though the specific organism is never found we are led to regard a chronic vaginitis, occurring in a baby or little girl, and resisting a fair amount of good treatment, as of gonococcal origin. This belief is often confirmed by the discovery of a positive smear in the mother, or some other member of the household with whom the patient has been more or less closely in contact. Should the gonococcus fixation test of the child's blood prove to be moderately or strongly positive, one's doubt will also be removed, and for this

* Read before the Springfield Medical Society, February 28, 1916.

reason this test should be made in all cases where the microscope fails to reveal the organism. A blood test which is reported as "weakly positive" or "negative" is of doubtful value under these conditions.

Our treatment of these cases presents no startling innovations. Douches of potassium permanganate 1-5000, or of silver nitrate 1-1000, given by means of a small rubber catheter connected with a fountain syringe, are of value. Of even greater importance are daily or twice daily distentions of the vagina with argyrol (5 or 10 per cent.), or protargol (1 per cent.). This is best done with an ordinary cone-pointed glass urethral syringe, the nozzle of which should be pressed against the vaginal orifice so as to prevent the too rapid expulsion of the injected fluid. The mother should be shown how to do this, and then be instructed to do it at home once or twice a day.

Owing to the undeveloped state of Bartholin's and of Skene's glands, and of the uterus and Fallopian tubes, gonococcal infection of these structures is uncommon. For this reason, blood-borne metastases such as arthritis, endocarditis and iritis are rarely seen in childhood. Yet in the presence of these lesions, the possibility of their origin from a gonococcal vulvovaginitis should not be overlooked. While some of these children can be cured in a few weeks, this result can be attained in others only after many months of persistent and careful treatment.

From our experience with gonorrheal urethritis in male babies and little boys (fortunately rare in comparison with girls) we are convinced that these infections are almost without exception of venereal origin. In these children there is evidence of an infection of the entire urethra and trigone as shown by the uniformly cloudy urines, and the frequent, urgent, and painful micturition which accompanies inflammation of the bladder neck. In spite of this extensive infection I have never seen the complications which so often attack the adult male, owing, no doubt, to the lack of development of the glandular structures of the genital tract. While in little girls there is generally no indication for internal medication, measures which will reduce the irritability of bladder and urethra are of importance in boys. These comprise an excess of liquid in the form of water or of milk, together with a urinary antiseptic, preferably sandalwood oil in 5 minim doses thrice daily. In addition to this, frequent or even daily injection of the entire urethra with argyrol or protargol should be given. The resistance of the external sphincter is so slight in these children that injection with a simple medicine dropper is sufficient to irrigate the entire urethra and bladder neck. Fortunately, the duration of the disease in these children is comparatively brief, generally not over a few weeks.

The subject of gonorrhea in the adult female opens a long and dreary chapter which may

drag itself through many months, or even years. While the duration of the disease and its severity may be favorably influenced by early, frequent, and intensive treatment, no rosy delusions can be maintained. In a minority of cases the infection is confined to the urethra and may be cured in a few weeks; in most the cervical canal becomes infected, necessitating many weeks or months of local applications of tincture of iodine, 10 per cent. silver nitrate, or even crude carbolic acid. During this time the vaginal vault is filled with a thick, tenacious, mucopurulent discharge, a plug of which protrudes from the cervical os. In many cases nothing short of a thorough curettage of the cervix and an application of the actual cautery will effect a cure. Infection of the endometrium and of the Fallopian tubes introduces a new, and even more serious chain of complications. We believe that infection of one tube leads sooner or later to that of its fellow, and that in any event a tube once infected may be a source of potential danger. For this reason, salpingectomy, generally bilateral, is always to be regarded as a possible necessity. In certain cases the ovary must also be removed, but in these cases its infection arises not from the gonococcus, but from pyogenic organisms. In dealing with this organ, especially in a young woman, the conservatism compatible with safety must not be lost sight of.

Gonococcal infection of Skene's glands is frequent. It is a most stubborn complication, generally giving rise to little or no annoyance. The treatment of these infected glands is often difficult, owing to their inaccessibility. Their mouths may lie just within the external meatus, in which case they can be injected only by everting the lips of this orifice with forceps after the use of a local anesthetic. They can then be injected with a strong solution of silver nitrate (2 to 10 per cent.) by means of an ordinary hypodermic syringe equipped with a blunt-pointed needle. In addition to this, it is our custom to inject the entire urethra with argyrol at every visit. As stricture of the urethra is by no means uncommon in women, and as it may have the same pathological basis as in men (infection of the urethral glands) careful treatment of this structure is an important matter.

Despite every effort, an involvement of one or both of Bartholin's glands may intervene. In this event, drainage of the resulting abscess is to be regarded as only a palliative measure. Exacerbation of the infection is practically inevitable, and the only cure of this complication lies in the complete removal of the gland. Meantime it is a source of real danger, not only to the patient, but also to others. I have yet to see an infection of Bartholin's gland produced by organisms other than the gonococcus.

The importance of the radical treatment of infections of the deeper structures of the female genital tract lies in the fact that they are more than likely to give rise to metastatic complica-

tions such as arthritis, iritis, and endocarditis. In this connection it may be said that we regard vaginal douches, whatever their ingredients, as valuable more for their cleansing, than for their therapeutic effect.

As gonorrhea in the male is far more frequently seen than in women or children, a thorough understanding of its extent, and of the difficulties associated with its diagnosis and cure is of the utmost importance.

Let me say at once that a simple urethritis, which affects only the anterior urethra, and which may be cured in about a month's time, forms only about one-tenth of all our hospital cases of this disease. While we believe, of course, that the gonococcus infects only the anterior urethra at the outset, we also believe that it invades the posterior urethra and prostate at an early date, generally before the patient seeks relief. It is undoubtedly true that bad treatment or neglect may hasten the invasion of the deep urethra, but, on the other hand, it is equally true that this catastrophe may occur in spite of the best treatment. In other words, infection of the posterior urethra and prostate results from a bacterial progression over which we have little or no control.

As it is of the utmost importance to determine the degree and extent of the infection in every case, we have adopted the following routine method of examination.

A careful history is taken of the number and date of previous gonococcal infections, together with their duration and complications, and the present condition is inquired into in detail. It is extraordinary how many stubborn cases one sees with a slight urethral discharge as the only symptom. For various reasons which I shall point out later it is advisable to investigate the urinary history, including frequency, dysuria, and urgency, and also any symptoms pointing to past or present disease of the kidney or bladder.

The presence of a urethral discharge is noted and a careful inspection of the external genitals made. This may reveal an obscure focus of infection which has escaped the attention of both the patient and his physician, but which may be sufficient to account for the chronicity of the disease. I refer especially to the little false pockets close to, or just within, the meatus, and to infected urethral follicles. The epididymides and vasa deferentia should be carefully palpated, as pathological changes in their structures may have an important bearing on the past or present condition. The urethra is then calibrated from meatus to external sphincter, or cut-off muscle, for it is not an uncommon experience to find a stricture which gives no symptoms of its presence other than a chronic urethral discharge. On the other hand, one not infrequently sees a patient who is said to have or to have had a stricture of the urethra, and in whom no such lesion can be found. The error may be

explained by the statement that localized spasm of the urethra may sometimes so closely simulate stricture that only the most experienced hand can detect the false from the true, and then, only when the patient is fully etherized. Calibration of the urethra is best carried out with a flexible bougie, or better, a *bougie à boule*, 27 French in size, or as near this as the meatus will admit. If this instrument passes smoothly no stricture is present. Before asking the patient to urinate, his anterior urethra is carefully rinsed out with plain water, or with a solution of boric acid solution or permanganate. The presence of shreds in this fluid is then noted. After this the patient is requested to pass his urine in two glasses. As the anterior urethra is now clean, shreds or turbidity in the first specimen must come from that portion of the urethra lying behind the cut-off muscle. The second glass will be clean unless the infection of posterior urethra and prostate is extensive, or unless the entire urine is infected from a pathological condition of bladder or kidneys. In this event the third and subsequent urines passed will also be turbid. Without preliminary irrigation of the anterior urethra the time-honored "two glass test" may be of no value, and lead to erroneous conclusions. We believe that the normal bladder can be infected only with difficulty. It is only when the bladder has been severely traumatized, during confinement, for example, or when there is residual urine from mechanical (diverticulum, obstructing prostate) or nervous (tabes) origin, that one should hesitate to pass a catheter without first giving a urinary antiseptic. Therefore, in most cases it is justifiable to pass a small soft rubber catheter into that viscus. This serves two purposes; first, it shows the presence of residual urine, indicative of a bladder diverticulum, or of an obstructing prostate; second, it enables one to fill the bladder with the irrigating fluid. This being done, a rectal examination is made and any pathological changes noted in the prostate, seminal vesicles or ampullae. While such changes are of importance when found, an apparently normal condition of the structure named may be revealed. Gentle massage is then performed and in most cases a drop or two of prostatic and vesicular secretion can be expressed from the external meatus. A drop of this is examined under the microscope, dried and stained with methylene blue, or merely mixed while wet with a drop of ordinary acetic acid. By either method, the presence of pus in the prostatic secretion can be detected and spermatozoa can be seen. The amount of pus is a valuable indication of the degree of prostatic infection. The presence of spermatozoa is an important finding, but their absence does not necessarily signify that the patient is sterile. Cultures of this expressed secretion are of little practical value. They will be either sterile, or show only a profuse growth of the staphylococcus.

While the actual performance of this so-called "localization test" can be carried out in 5 or 10 minutes, it enables one to say with great accuracy just what structures are infected and to what degree. In the light of these findings intelligent and efficient treatment can then be instituted. One's opinion of the case will also be largely influenced by the result of a gonococcus fixation test of the blood, and this should always be done, especially in the presence of doubtful or negative clinical findings. A strongly or moderately positive reaction indicates the presence of the gonococcus somewhere in the body. Occasionally it may persist after the disappearance of the gonococcus and be due to the presence of antigens already formed. On the other hand, a weakly positive or negative test is of value only in conjunction with the clinical findings. If no clinical evidence of gonorrhea can be found after repeated examination, one must say that the disease is cured; if, however, the clinical signs are clear, treatment should be continued until they disappear. The question of cure is often one of the utmost difficulty, since the possible infection of a present or future wife is always at stake. We believe that the rule should always be "safety first," and that too much rather than too little treatment should be given. It is our experience that the cure of chronic prostatitis, if no complications intervene, takes anywhere from three to six months, often longer.

Let us now take up, seriatim, some of the points brought out by our routine examination. Many smears of the urethral discharge, stained by the Gram method, may fail to show the presence of gonococci. Cultures, planted on hydrocele agar, may be likewise negative. Although positive results are rarely to be obtained from the discharge after the lapse of a few weeks or months, persistently negative results do not necessarily mean that the patient is free from gonococci.

It is important to search for stricture, as this lesion will often give no evidence of its presence other than a chronic discharge. In fact, it is the only cause, so far as we are aware, of a chronic anterior urethritis. It should also be remembered that a stricture resulting from gonorrhea cannot form until the lapse of at least three, probably five, years after the initial attack. There are cases in which the value of this evidence from a medico-legal standpoint may be great. In any event, it bears out our belief that one of the symptoms of gonococcal infection is a gross disregard for the truth on the part of the patient.

I spoke of the infection of the urethral follicles. This may occur at any point along the urethra, resulting in the familiar periurethral abscess. It is this which lays the keel for the future stricture. Those follicles which lie on either side of the frenum seem to be peculiarly susceptible to infection. Even after the abscess

has ruptured or has been incised, history may repeat itself in the form of a re-infection, not only of the follicles themselves, but also of the entire urethra. A minute fistula generally follows and this proves to be a source of annoyance to the patient by its constant discharge of pus, and, at times, of urine. Complete excision of the whole infected mass is indicated. It is a simple procedure and if properly done will put an end to the difficulty at once.

The false pocket which lies near to, or within, the meatus is of congenital origin. It has a mucous and submucous lining and while it is usually a mere dimple, it not infrequently will prove to be half an inch or more deep. The gonococcus will cling to this haven of refuge with surprising tenacity and can be ousted only by complete excision of the pocket. The chief reason for the removal of this pocket lies in the fact that it may repeatedly re-infect the urethra.

We have found it good practice to divide up to normal size (28 F., a congenitally small not admitting a 21 F. sound), but otherwise normal meatus, or one which is associated with the balanitic type of hypospadias. Free drainage is most important and a small meatus will only add to the chronicity of the disease.

There are several things which one learns from long experience in the study of gonorrhea. One is that chronic urethritis, in the absence of stricture, generally means chronic prostatitis. Early and thorough treatment of this organ by massage is, therefore, strongly indicated. We are constantly seeing patients whose physician has regarded the prostate as normal, or has massaged for a long time without effect. It will be remembered that one often can detect no pathological change in the prostate or vesicles by the examining finger, and the microscope must be depended upon for the facts. If massage has proved to be of no value, we believe that it is because this procedure has been improperly performed, or carried out for an insufficient length of time. It must, however, be admitted that we occasionally see a case in which, despite all effort, the symptoms and signs show no improvement, even after weeks or months of treatment. The source of the infection must then be searched for in one of the unusual structures such as the verumontanum or the seminal vesicle.

Another thing which we have learned is that other diseases of the genito-urinary tract may antedate or intervene during an attack of gonorrhea. We are constantly making discoveries of this nature. I recall two cases, which I have recently seen, of diverticulum of the bladder, in whom the long-continued treatment for chronic prostatitis was of no value. A persistently cloudy urine, and a considerable and constant residual aroused suspicions which the cystoscope confirmed. Removal of the diverticulum has cured both patients.

I have now under observation two cases of urethral calculus referred to me by their physicians for the cure of an apparently stubborn prostatitis. In one, there has never been a symptom suggestive of stone; in the other, a careful cross-examination brought out a history of vague pain referable to the right kidney. In both cases the cloudy urine, containing albumin, blood and pus aroused suspicion of a lesion other than that produced by the gonococcus. The cystoscope and x-ray clinched the diagnosis. I have removed more than one tuberculous epididymis which became acutely inflamed during a gonorrheal infection and I could recite to you the history of several patients whose kidney infection, tuberculous or pyogenic, was entirely lost sight of during the intense study given the prostate and posterior urethra.

When it is remembered that the genito-urinary tract, both of the male and female, is not made up of smooth-walled tubes and cavities, but is a series, more or less closely in contact, of compound racemose glands, each with a small orifice, it is not surprising that the gonococcus is so hard to dislodge. In the female, the glands of Bartholin and of Skene, the deep crypts lining the cervical canal, and the narrow and tortuous Fallopian tubes; in the male, the meatal pockets already described, the innumerable follicles distributed the length of the urethra, the sponge-like prostate with its many minute orifices opening into the posterior urethra, the blind pocket of the verumontanum, and the extremely complex and tortuous cavity of the seminal vesicles and ampullae with their drainage dependent entirely upon the small calibred ejaculatory ducts—all these combine to give the gonococcus a foothold which may baffle the best of us.

But there can be no question that, barring reinfection, the gonococcus spontaneously dies out sooner or later, leaving behind evidences of prostatitis and urethritis which may be perpetuated by other organisms for an indefinite period. As to the persistence of gonococci in the urethra, no more authoritative statement can be found than that of Keyes (*American Journal of the Medical Sciences*, Jan., 1912). He tabulated "the results of laboratory investigation of 86 patients clinically cured, or nearly cured, of urethral gonorrhea." Thirty-six were investigated by the complement fixation test, 77 by smear and culture. He felt "justified in stating that in 64 cases gonococci disappeared in less than a year, in 7 others with urethritis, examined from two to eight years after the onset, gonococci were not found, while in 6 gonococci persisted from one to two years."

"I have never seen one . . . that convinced me he had harbored gonococci more than three years."

A word as to vaccines should not be omitted. We have tried them faithfully in both private and hospital practice over a long period. Vari-

ous types of vaccine, autogenous and stock, sensitized and non-sensitized, are constantly being put forth, each said to be the *sine qua non*. All I can say is that not one of them has proved of the least value, either to cure or to alleviate the symptoms. Being optimistic, we are awaiting the appearance of some preparation which will actually fulfil the claims made for its predecessors.

In conclusion let me tell you what evidence is demanded by the Genito-Urinary Clinic of the Massachusetts General Hospital for a cure of infection by the gonococcus. This standard has been agreed upon only after careful study of the disease as it affects children and adults. The patient must meet these requirements at least once, preferably twice or three times at intervals of at least two weeks and not less than a month after the cessation of treatment.

In the male we require:

1. Absence of gonococci.
2. Gonococcus fixation test negative.
3. Clinical evidence
 - a. Clear urine.
 - b. No pus in prostate or vesicles after three examinations, or pus present but a negative blood test.

In women we require:

1. Negative gonococcus fixation test.
2. Absence of clinical evidence in the lower tract.
3. Negative pelvic examination.

Finally in female children we require:

1. Absence of gonococci.
2. Little or no pus in the vaginal smear.
3. Negative gonococcus fixation test.

There can be no question that the average general surgeon or practitioner is incompetent to undertake the treatment, and especially to determine the cure of a gonococcus infection of the urethra. By so doing he assumes a burden of responsibility which he has no right to bear and which, at a subsequent time, may work serious harm to the patient and through him to the community. Strange as it may seem, the physician at whose feet the blame is to be laid, either through ignorance or dishonesty, is rarely, if ever, called to account. We are constantly seeing evidences of disaster to husband or wife arising either from their own ignorance or indifference or from a faulty, but well-intentioned, opinion expressed to them by the physician. The medical profession, to say nothing of the laity, is by no means yet conscious of the serious nature of gonorrhea, of the difficulties of its management, or of the responsibility involved in pronouncing it cured. The layman is slowly awakening to the situation and is demanding better and more expert treatment and judgment. In the larger centres of population he can get this if he takes the pains; in the smaller communities this may not be possible.

But how is the layman to judge of the com-

petency of any given physician to handle his case? The mere fact that the physician claims to be a "specialist" by written or verbal advertisement avails nothing; in fact, he is usually grossly inadequate and generally dishonest. There are certain physicians whose professional reputation is such that no inquiry need be made; others can be found out about by inquiry of the proper authorities. The more intelligent laymen (especially strangers) are now getting this information in many instances from the large public hospitals, but a better and more adequate scheme is here presented. As the venereal diseases are now recognized as matters concerning the public health, it seems only proper that the State Department of Health should coöperate in seeing not only that the layman who wishes private treatment can get it from a reliable physician, but also that he should know where to turn for this information. The Public Health authorities should keep on file a list of such physicians throughout the State who, by their training and experience, and hospital and teaching connections, are competent to handle venereal disease. This would enable a patient in even the most remote community to get in touch with a thoroughly reliable and easily accessible physician. To acquaint the laity with this plan would require an educational campaign on the part of the Public Health authorities, but its benefits to the community would undoubtedly more than offset the comparatively small expense and labor involved.

Original Articles.

OPHTHALMIA NEONATORUM.*

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THE purpose of this short paper is not so much to impart new information on a subject already much discussed, as it is to refresh our memories, and stimulate us all to do our part to lessen the number of damaged eyes and wrecked lives from this preventable disease. For does not Parson's characterization: "It is a preventable disease occurring in new-born children as the result of carelessness at the time of birth," lay the odium of its appearance on the attendant at that time?

Ophthalmia neonatorum was mentioned by the earliest writers: Soranus, a Greek physician, living A.D. 98-138, makes specific reference to it. Recognition of the connection between leucorrhoea in the mother and ophthalmia in the child dates from the investigation of S. T. Quellmalz in 1750. James Ware, writing in 1780,

gives a good general clinical description, but does not point out that there is a relationship between the two. In 1807, Gibson, a Manchester surgeon, writing in the *Edinburgh Medical Journal*, cites definite cases establishing the connection between the two diseases, and gives specific preventive instructions. These findings were corroborated by Whitehead in 1847.

Much discussion pro and con followed, until the discovery by Neisser in 1879 of the gonococcus which, he stated, was found in the pus from ophthalmic eyes of infants and adults with gonorrheal ophthalmia, and from the secretions of specific vaginitis and urethritis; this definitely settled the question for those who were open to conviction. But there remained many who attributed the trouble to dirt, soap, colds, exposure to sunlight, etc., with frequent disastrous results.

That the leucorrheal discharge need not be profuse or recent was pointed out by Weeks in *The Medical Record* in 1886. In fact only 20% of mothers show acute symptoms at time of birth and the persistency with which the infection lasts was shown as early as 1853, when Smith, writing in the *Lancet*, reported a case in which two births, separated by eight years, resulted in ophthalmic infants.

The time of infection is, generally speaking, soon after birth, the infant blinking into its conjunctival sac infective material which clings to its eyelids. Doubtless at the time of the first bath there is ample opportunity for infection. But intra-uterine infection is by no means as uncommon as is held by some authorities; for Stephenson was able to collect 90 cases from the literature on this phase. It is generally believed that a great predisposing cause is prematurity, on account of lessened general resistance, and the thinness of the protective eye membranes.

The wide variance of opinion regarding the frequency with which gonococci are present in these cases seems to be due to the fact that in some series of cases, the bacteriological examinations are made before treatment is instituted, and in others, not for some days afterwards.

Another reason is the varying degrees of care used to differentiate it from other intra-cellular Gram-negative diplococci, notably the micrococcus catarrhalis. Frequently the smear shows what the examiner takes to be gonococci, which later, by growth on ordinary media, prove to be some other micro-organisms. It is only by culturing the pus that one can be sure, as the gonococci grow sluggishly and only on a specially prepared agar tube. In the *American Medical Journal*, Dr. Derby, on the basis of careful examination made in a series of cases, states that 51.3% of the 149 cases under consideration showed gonococci, and quotes Bartlett in a series of 70 cases as placing the percentage at 54. Stephenson, in 1829 cases, states that 65% showed gonococci. Some other micro-organisms commonly found in the pus are pneumococci, bacterium coli, Koch-Weeks' bacillus, Morax-Axenfeld diplobacillus, and less frequently,

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streptococcus pyogenes, Klebs-Löffler bacillus, and staphylococcus.

It is difficult at the present time to know how much importance to give to the so-called "chlamydozoa" or epithelial inclusion bodies, first discovered by Prowazek in 1907, in connection with trachoma, named by Greeff trachoma bodies, inasmuch as they have been found in cases of gonorrheal and non-gonorrheal conjunctivitis, as well as in normal conjunctivae. At present their significance is, to say the least, not understood. Stephenson thinks they play a considerable rôle in cases that give a negative smear, which vary from 15% in his series, to as high as 46.6% in Auge's series of 166 cases, mentioned by Stephenson.

Before taking pus for a culture or smear it is well to remove the encrusted pus from the eyelids, wash out the conjunctiva, and then wait until fresh pus has accumulated. In this way there is less danger of getting a mixed culture. Unless there is someone to hold the child, so that the examination can be thoroughly made, it is best to administer a few whiffs of a general anesthetic at the first examination, so as to make sure of the condition of the cornea.

Those familiar with the great difference in the virulence of the disease in the infant and in the adult find it probable that the mother confers a strong degree of immunity upon the child. Although the results of the examination of the blood for the complement fixation reaction for gonorrhea in 23 cases were negative, excepting in two, it is hard to assign any other reason for the relatively mild course it takes in the infant; it being difficult to agree with Dr. Theobald, who considers this to be due to the fact that the infection causing the ophthalmia in the infant has long been latent and is now not very virulent; whereas in the adult the inoculation is more apt to occur during the height of an attack of urethritis, when the infective power of the discharge is greatest.

The result of the examination of the blood for the Wassermann reaction does not seem to bear out Dr. Stephenson's idea that in many cases in which there is a negative smear, the discharge is a concomitant sign of congenital syphilis, for in only one of the 22 examinations made at the Massachusetts General Hospital Laboratory was the reaction positive, and that was in a case that was obviously syphilitic.

The signs presented by the disease depend to some extent on the severity of the infection and the number of days that have elapsed since its onset. Ordinarily it starts from the second to the fifth day after birth; cases occurring before the second day are due to intra-uterine infection, and those after the tenth day to secondary infection.

We are all familiar with the redness of the edges of the eyelids accompanied by a thin serous discharge and swelling of the palpebral conjunctiva. The discharge soon becomes purulent

and the lids tremendously thickened and bulging. The great danger lies in corneal infection. This oftenest has its direct start from traumatism, from the fingers either of the infant or the attendant, or from pressure from the shortened and heavy lids against an often immature structure weakened because of the strangulation of its nutrition. There may be, (a) a general corneal haze that clears up; (b) slight abrasions of the corneal tissue that respond to mild measures, as tincture of iodine; (c) ulceration with corneal rupture and prolapse of the iris and retention of some vision; (d) extensive ulceration that resists treatment and results in permanent opacities.

Dr. Theobald thinks that ulceration always means a mixed infection. In regard to the complications Dr. Stephenson states that they are the same as those of gonorrhea. Arthritis is the most common, and is often an expression of general sepsis, as are meningitis and endocarditis.

Those who have attempted to treat the disease at home, will be heartily in accord with Dr. Derby's emphatic statement that unless it is feasible to have in the house a trained nurse and a competent woman to follow out her instructions, a specially reserved ward in a hospital is the proper place for treatment. His results have been so remarkable that it seems to me there can be no argument on this point. True it is, that infants thrive better when breast fed, and that frequently mothers cannot accompany their infants to the hospital; yet when they are fed along lines laid down by a pediatrician the mortality results compare most favorably with general mortality of infants; in Dr. Derby's series of 124 cases followed up for one year, the mortality was 80-1000 against a general infant average in Boston of 103-1000. Skilful and conscientious nursing is the sheet anchor in getting these cases cured quickly.

The treatment, to be successfully carried out, demands the services of a skilled attendant day and night for at least the first few weeks. The child's eyelids should first be wiped dry, and warm saturated boric acid or normal saline solution used to cleanse thoroughly the conjunctival sac. This may be done by squeezing the warm fluid from pledgets of absorbent cotton. This should be done frequently enough to keep the eyes free from pus, (providing it is not so frequently as to lower the child's nutrition by disturbing its sleep, or by causing regurgitation of its food). Where the secretion is profuse it may be necessary to give this treatment every half hour, whereas in other cases every three hours will be sufficient. After the washing out, it has been my practice to anoint the lids thoroughly with sterile vaseline. Every three or four hours a drop or two of 25% argyrol, or 4% protargol, freshly prepared, should be used. The use of undines or syringes for irrigating the conjunctival sac seems to me to be adding danger without possible benefit. In fact, the

less the eyes are handled the better. To avoid as far as possible traumatism from the infant's fingers, its arms should be confined so that it cannot reach its eyes, and the doctor should instruct the nurse to keep her nails closely trimmed, to lessen the danger of her abraising the cornea. For her own safety she should wear goggles and frequently thoroughly cleanse her hands. To some this may seem unnecessary advice; it is, however, important, since many nurses have never seen a case while in training.

Frequently, short eyelids cause pressure against the cornea; this condition should be relieved by canthoplasty. My experience has taught me that the dropping in of argyrol or protargol solution is followed by much better results than is the eversion of the eyelids and the application of the solution directly to the palpebral conjunctiva. My personal belief is that many corneas are traumatised by this procedure, and if it is done at all it should be by an oculist. Nor do I believe that the use of a solution of nitrate of silver is nearly so effective in the treatment of this disease on account of its irritating properties, as are the above mentioned solutions. It has no part in the treatment as carried out by me. Also it does not appear that iced compresses, formerly so much used, have any value; and how solutions of atropine in cases of corneal involvement do good I fail to understand. The same is true of esserine, which Stephenson recommends. Hot applications in conjunction with the regular treatment seem to help in clearing up the corneal haze, and the application of carbolic acid or tincture of iodine is often of service in slight abrasions; but if the ulceration is at all extensive a general anesthetic should be given and the ulcer treated surgically, either by cauterization or by Saemisch's section. Frequently later in the disease the discharge becomes thin and watery. In this condition it has been my experience that less frequent treatment, and greater efforts to improve the child's nutrition are indicated. Sometimes the substitution of zinc sulphate or tannic acid for the organic silver salts hastens the cessation of the discharge. The use of vaccines or sera, except in cases of streptococcus, pneumococcus, or Klebs-Löffler infection, has not proved very successful. I do not know of anyone who uses them except in conjunction with the regular treatment. Offret, who probably has had the greatest experience with them, cautiously advises their use along with irrigations and other local treatment.

Dr. Stephenson in a recent personal communication says: "In the treatment of an ordinary case of gonococcal ophthalmia, I employ argyrol, 15% to 25%, dropped between the eyelids two to six times a day, according to circumstances. Only in case this fails do I still employ a 2% solution of silver nitrate, applied directly to the everted eyelids, first carefully freed from secretion. I am under the impression that argyrol is

a bactericide so far as gonococci are concerned, although I cannot for the moment quote experimental authority for that statement. I now use liquid paraffin abundantly in these cases, and am convinced that it is of service. The most severe type of so-called ophthalmia neonatorum that I ever see is associated not with gonococci, but with streptococci. Even pneumococci cases may be very severe, and lead to loss of the eye. Usually, they are mild here in London. I have on occasion seen amicrobic cases of a severe nature, but that is rare. Finally, as to detergent lotion, I nowadays limit myself to some mild and non-irritating fluid, such as saline 1.4% or ordinary boric lotion."

Regarding the value of argyrol in these cases there is considerable difference of opinion. Dr. Derby, in his recent article in the *American Medical Journal*, says, "I believe that in the acute stages of the disease a mild remedy is indicated. The high specific gravity of argyrol, 25% (in the neighborhood of 1.070), may be of value in its cleansing action; it is surmised that it tends to float the pus out of the hollows of the conjunctival sac. A manifest advantage of such a solution, and one to which I have not seen reference, is the early warning given of a break in the corneal epithelium by the immediate staining of the area involved."

I have always been well satisfied with the results obtained from its use in suppurative conditions about the eye, despite the fact that many laboratory men think lightly of its germicidal properties. The manufacturers of argyrol, I find, lay no stress on its bactericidal properties, claiming that inflammation is a complicated pathological process, and the activity of bacteria is but one feature thereof; and that to eliminate the inflammation, no drug that has mere bactericidal powers can have the therapeutic properties of argyrol, which has so many attributes that are effective in removing inflammation. Continuing, they maintain that it is strictly in accordance with the scientific and practical status of the matter today to state that the best informed surgeons attribute little, if any, value to mere bactericidal data in their determination of the clinical value of a drug. In support of their assertion they point to the fact that acetone, which in laboratory tests kills all and any bacteria in a few seconds, has no clinical value in cases attended with the activity of bacteria.

In discussing the progress of the disease, Dr. Stephenson states that it usually becomes bilateral. However, in the series of cases reported from the Massachusetts Charitable Eye and Ear Infirmary by Dr. Derby, 23% were unilateral; and this authority adds, as proving the great desirability of constant watchfulness on the part of the nurse, "Not one became bilateral after entrance to the hospital." The only precaution taken was to have the child lie on the affected side.

Regarding the final outcome, Dr. Stephenson,

after reviewing a large series of these cases, says that, speaking generally, probably one infant out of every ten loses one or both eyes, while in 25% of cases the cornea is affected. Taking results in general, Dr. Stephenson's figures probably are as liberal as the facts merit.

While it is obviously unfair to compare hospital results with those obtained by men treating cases in homes where skilled assistance is in many cases lacking, yet one is scarcely prepared for the vast difference in results as shown by Dr. Cheney's paper on "The Control of Ophthalmia in Massachusetts." In ten cities, Boston not included, there were in 1909, 147 cases of ophthalmia neonatorum known to have occurred. It is probable that these figures do not represent the entire number. Of these cases, the treatment was investigated in 104 with the following results: "Thirty-two were treated in hospitals, 11 by oculists without the aid of any nurse, 14 by obstetricians, one at a city farm and one unknown. Private physicians, attending births, were not only responsible for 85% of the above severe cases, but they also endeavored to cure 43%. Out of 61 registered physicians in eight of these cities, each of whom was confronted at least once during 1909 by a case of ophthalmia neonatorum, 39, or over 64%, neither asked at any time for expert help, nor yet transferred these cases to any hospital, but invariably tried their inexpert hands at restraining the disease which they failed to prevent. Their methods and results are as follows: If the parents could and would pay enough, these 39 treated the baby at home. If the parents could or would not pay sufficiently, these 39 only treated the baby when brought to the office. In one way or the other, they treated 44 gonorrheal or probably gonorrheal cases; and they saved on an average not quite one baby's eyes apiece. But the sight of nine babies they did not save, and of these nine they lost by death, three. For these physicians the best that can be said is, that they reaped the result of their own laxity in 20% of their eye cases; or in other words, they failed to prevent blindness in every fifth case. In comparison with the above results in ophthalmia neonatorum treated by the general practitioner, let us take the results of those treated by the oculist. Among 116 babies treated in the same year (1909) at the Massachusetts Charitable Eye and Ear Infirmary, only six became blind and *all of these* were brought to the Infirmary after ulceration of the cornea was well established."

My experience has taught me that it is unwise to give a definite prognosis in these cases. I well remember a baby in whom the discharge had practically ceased and who was keeping its eyes open for longer periods each day, (a supposedly strong indication that it was progressing favorably). Just a few days before I thought I could discharge it as cured, it had a corneal ulcer develop which left a damaged eye. Again,

in another infant, whose nutrition we seemed unable to keep up, the disease ran a long course, and after the discharge had ceased the baby developed meningitis and died. Experiences like these make me think it is not good judgment to state that these cases all recover with normal eyes provided they have skilful nursing, even when this includes far more than the careful cleansing of the eyes and the application of the different remedies, for the judgment to know when not to treat them, is as important as is the ability to treat them.

Before the case is discharged two negative smears should be taken, at intervals of 48 hours; for the fact that gonococci have been found in the conjunctiva 25 days after the eyes were apparently well, and 60 days after the onset of the discharge, shows the importance of bacteriological examination before these babies pass out of observation; doubtless the failure to do this must account for many recurrences. Until the identity of the micro-organism causing the discharge has been established bacteriologically, all cases should be treated as if due to gonococci, for the fact that many doctors are inclined to wait until the report from the laboratory clinches the diagnosis, before establishing a nurse in care of the case, is one great cause of damaged eyes. Moreover, the treatment which will prevent a gonorrheal case making headway is also the proper treatment for other cases. In cases where pneumococci, Klebs-Löffler, or streptococci are found, vaccines are combined with the other treatment, in which case they often produce brilliant results.

To show the importance of a thorough bacteriological examination the following case is cited:

A few months ago I was called in consultation to see an infant eight days old who, since the fourth and fifth days, had a discharge from the eyes. Clinically, it looked like gonorrheal ophthalmia neonatorum. The diagnosis was more probable from the fact that the father confessed to a gleet and that the practical nurse was then under the care of a physician for gonorrhea. To clinch this diagnosis, the slides showed numerous micro-organisms resembling gonococci. Consequently I recommended the case to be immediately sent to the Massachusetts Eye and Ear Infirmary. This was done within a few hours. There it was found that the micro-organisms grew rapidly on ordinary media and were, therefore, not gonococci; and the eyes were well in ten days.

It seems to me that it should be made plain in the literature sent, not only to doctors, midwives, and nurses, but also to prospective mothers, that only 50% to 65% of the cases of sore eyes in babies are due to gonococci. This will, as Dr. McColl states, make it easier to report these cases, since there will not be the same tendency to conceal them from a sense of shame. On the other hand, many doctors who in their private practice have had cases of conjunctivi-

tis in infants that got well in a few days, have an idea that all have the same aetiology and are quickly cured, and so neglect to call in skilled assistance until, in cases due to gonococci, it is too late to prevent serious damage.

Boards of health and commissions for the blind are, I think, prone to forget that these cases are comparatively uncommon and that busy practitioners are, unless their memories are refreshed by the frequent receipt of literature, apt to overlook their terrible importance.

The prevention of these cases is at once so important and so simple that it should engage the attention of every physician. Since Cr  d  's announcement in 1880 that a 1% solution of nitrate of silver dropped in the child's eyes shortly after birth prevented this disease, there has been no excuse for its appearance. In 1880, just before and just after the application of this newly discovered preventive measure, the percentage of ophthalmia fell from 7.4%, that is, 14 cases out of 187, to one case out of two hundred, that is, one-half of 1%, and in this case the disinfectant had not been used. Later Cr  d   reported 1160 births during the years 1880-1883 with only one case. The report from the Sloane Maternity Hospital, New York City, is even more remarkable, showing that in 4660 births during a period of 6 years in which Cr  d  's treatment was carried out, no cases of ophthalmia developed. The figures tell their own story: that if the drops are properly used, and the child and mother cared for in a cleanly way, there will be no ophthalmia and consequently none of the terrible misery, suffering, and sorrow it leaves in its wake. No valid objection against the use of prophylactic drops can be sustained. It sometimes causes a mild conjunctival catarrh, but this soon subsides and is of no consequence. Cases of injury to the cornea or conjunctiva that have been reported have occurred only when very strong solutions were used with force and awkwardness. One per cent. solution nitrate of silver, when properly used, does nothing but good and it should be employed at every birth. Many other solutions are used as a prophylactic, notably argyrol, protargol and bichloride. The results from their use have been very gratifying, but as nitrate of silver absolutely prevents the appearance of the disease, I see no reason for giving it up, nor do I think it good judgment to disseminate the idea that any antiseptic solution is a sure preventive.

In many states there are now laws which, if enforced, will stamp out the disease.

In 30 states it is necessary to report babies' sore eyes to the board of health.

In 11 states local health officers are authorized and required to secure medical attention for uncared-for cases.

In 5 states a reporting law is printed on the birth certificate.

In 4 states *only* are births reported early

enough to be of assistance in the prevention of blindness.

In 9 states question as to whether precautions have been taken against ophthalmia neonatorum is included on the birth certificate.

In 12 states free prophylactic outfits are distributed to physicians and midwives.

In 6 states the use of a prophylactic is compulsory.

In 19 states popular educative literature is sent out by state boards of health.

From the foregoing it will be seen that the states are far from having standardized legislation, for in no state do we find all the desired provisions existing, while in some no preventive legislation is enacted.

In Massachusetts the health authorities are greatly aided in their work by the efficient and enthusiastic assistance of the Commission for the Blind, and in the larger centres by social service workers as well. What enforcement of the laws has produced is shown by the latest report of the State Board of Health, which states, "In the last three years the campaign carried on by the state board of health in co  peration with the Commission for the Blind has reduced the number of cases of blindness from this cause 50%."

The value of sending literature and of the prosecution of doctors and midwives, derelict in reporting, is clearly shown by Massachusetts statistics. In 1910 there were only 377 cases reported. In that year, however, several prosecutions were successfully conducted, and in the following year 2600 cases were reported. In 1912 there were 573 cases investigated; 22, or 3.8% ended in blindness. In 1914, 400 cases were investigated; of these 12 or 0.85% ended in blindness.

So soon as local boards of health assume adequate investigation of these cases the state board does not come into their territory. This accounts for the decreasing number of cases investigated. The City of Boston, for example, which accounts for approximately 100 cases a month, investigates its own.

The following is what this state, which leads all others in preventive legislation, provides for the prevention of this malady:

1. Notification of birth in 48 hours (on this blank is a printed notice stating that ophthalmia neonatorum is reportable). In some cities this notice is not printed on birth notification blank; it should be in all.

2. Use of an approved preventive in every Lying-in Hospital.

3. Free distribution of prophylactic.

4. Immediate reporting (6 hours) by physician, nurse, or hospital of ophthalmia cases.

5. Lying-in hospitals must report to State Department of Health uncared cases leaving hospital.

6. Authorization of boards of health to deal with such cases.

7. State officers must advise with local

boards of health and follow up cases reported, so as to ascertain the treatment that is being used, a definite standard now being required. Consultation with an oculist and the services of a trained nurse are necessary in serious cases. In addition to the above I feel that it should be obligatory for all doctors, nurses and midwives to use a prophylactic at the time of birth regardless of the wealth or social standing of the parents.

In New York State, where the National Committee for the Prevention of Blindness is actively engaged in giving publicity to the cause and prevention of the disease, the percentage of inmates in blind schools from this cause has fallen from 24% in 1910, to 15% at the present time.

The committee appointed by the American Medical Association under the direction of Dr. Allport is doing yeoman service, distributing literature and giving lectures in large centres to present to large audiences this important subject and so influence public opinion. This will make it easier for health officers to demand reports and provide means for the treatment of these cases.

The hue and cry against midwives as the chief offenders is not borne out by the reports. In the fourth report of social service work at the Massachusetts Charitable Eye and Ear Infirmary one reads: "The most unexpected finding in our four years' study has been the fact that the doctors and not the midwives are responsible for blindness from ophthalmia neonatorum. So far as our figures show, however, this is not because midwives have been careful while doctors have been careless, but because the midwife has appeared very little in our figures. Out of 388 cases under observation a midwife attended the birth in only 10 cases."

In New York State 40% of the births are attended by midwives, yet only one-third of the cases of ophthalmia occur in cases under their supervision. (These figures are difficult of belief but are taken from authentic sources). In Massachusetts it appears that there are comparatively few midwives. Inquiries made on this point of two well-informed men brought the answer that there were between 300 and 500. In New York City on the other hand, there are 1382 registered and they officiate at one-half the births. In Chicago 86% of births are reported by midwives. (Reporting of births in Chicago is said not to be satisfactory).

In some states (too few) it is necessary for these women to be registered, and in this connection The Metropolitan Life Insurance Company has issued an educational leaflet entitled, "Mother, Baby and Midwife," which warns prospective mothers against untrained attendants. In England midwives are compelled by law to use a prophylactic in every case; failure to do so revokes their license. In London, in 62 cases investigated by Dr. Stephenson, 37 were delivered by doctors; in 162 cases investigated

by Mayo, 90 were delivered by doctors. Midwives should in every state be compelled by law to pass some practical examination before they could be registered. Those so registered would soon weed out the inefficient by reporting them. They should in all states, as they now are in some, be instructed in the way to use prophylactic drops. It seems to me folly to ignore them and unjust to prosecute them without first educating them. The majority of them are amenable to kindly advice.

The manufacturers of proprietary medicines get us to prescribe their remedies by constantly calling our attention to their virtues (?). The board of health might well take a lesson from their persistence and send prophylactic sets not annually but monthly. I am informed that not nearly all the yearly appropriation for that purpose is used. Also it would be well to send men to medical societies in the smaller centres to elucidate the laws, for although the number of cases occurring in country practice is relatively smaller than in cities, yet the results obtained in the treatment of these cases are shockingly bad. Moreover, the scope of our educative work might with profit be vastly enlarged. Inform the poorer classes by sending frequently literature written so plainly that the most ignorant would understand. Here is a wonderful field of service for women workers. Tactful women visiting homes and holding small intimate meetings among those of the poorer classes to whom the cause and prevention not only of this, but of many other diseases could be explained, would, in my opinion, do a great deal of good. The payment of such workers in the small as well as in the large centres would prove a profitable investment for state funds.

When we consider that the extra cost of educating a blind child approximates \$3000, and that the estimated earnings of a blind person are only one-half those of a seeing person (taking the earnings of a seeing person for 35 years at \$17,500), we are forced to conclude that the loss to the community for each person blind from childhood must, including the special education, be in the vicinity of \$12,000. This amount would pay the salary of a capable woman for 14 years. But the good she would accomplish by raising the standard of health and happiness in poor homes cannot be represented in dollars. Printed postal cards addressed to the social service worker could be distributed to doctors, making it an easy matter for them to notify her where her services were needed; and in addition to this, doctors signing birth certificates could indicate that a nurse should call at this home. Moreover, to have the social service worker follow up the parents of ophthalmic infants for the purpose of eradicating the causal diseases is an activity promising most important results.

The prevention of ophthalmia, as in many other preventable diseases, is a matter of edu-

education. New laws safe-guarding health will, each year be added to our statutes, but they will be dead letters unless we, who are expected to be leaders in the prevention as well as cure of disease, are enthusiastic in friendly suggestions regarding them.

In Massachusetts we are justly proud of our record regarding the effectiveness with which the laws pertaining to ophthalmia are enforced. In the 1915 report of the Commission for the Blind, Mr. Henry Copley Green, field agent for conservation of sight, points out that in 1908, 7 children, or 5% of all the newly blind in this state, were so from ophthalmia neonatorum, while in 1915 the number was reduced to one, or to one-half of 1%. He adds that even if the state inspectors had done nothing else, their work against this disease has saved more than the total of their salaries.

The effect of nation-wide work in this disease is shown by the reduction in the number of blind children entering schools, from 25% in 1912 to 15% in 1915. The reporting by number, to the state boards of health, of syphilis and gonorrhea, the free examination of blood for the Wassermann reaction, and the free distributing of salvarsan, are forward steps which to some extent will lessen the number of ophthalmia cases.

It should be remembered that local boards of health have absolute power regarding the care of these cases; this should be an added reason for the appointment to these boards of men alive to their responsibilities.

In conclusion the writer would state that this paper does not in any way pretend to be an exhaustive study of this subject. In his private practice of 17 years he has had opportunity to treat 30 such cases. His observation of the treatment used and results obtained in this disease in other hospitals leads him to believe that in the Gardner Ward of the Massachusetts Eye and Ear Infirmary infants so afflicted are ideally cared for, and he believes that all cases occurring in this district should be sent there.

Much of the material for this paper has been taken from Dr. Stephenson's Middlemore prize essay on ophthalmia neonatorum, his article in the *Practitioner*, September, 1914; Dr. Derby's article in the *American Medical Journal*, October, 1915; standard text-books on ophthalmology, the reports from different state boards of health and commissions for the blind, as well as personal communications from several oculists. To all of these I wish to express my indebtedness and thanks.

THE PROBLEM OF RINGWORM IN CHILDREN.*

By E. L. OLIVER, M.D., BOSTON.

In considering the problem of ringworm in children, I am going to confine myself to ringworm of the scalp, because ringworm elsewhere on the body is usually of short duration and easily treated by simple methods.

Ringworm of the scalp, with rare exceptions, is a disease seen only in children, therefore its proper treatment and control should be of interest to this society. Ringworm of the scalp is caused by the growth of certain moulds or fungi in or around the hairs. It is a highly contagious disease, so that it is not uncommon to find several cases in one family.

There are two main varieties of fungus causing ringworm of the scalp, the small spored, *Microsporon Audouini*, and the large spored, *Megalosporon Endothrix*.

Each of these two varieties has its own characteristic growth on artificial culture media. Furthermore, ringworm produced by the *microsporon* can usually be differentiated clinically from that produced by the *megalosporon*. In the former the patches are usually single or few in number. Each patch is round or oval, rather sharply defined at the borders, and covered with short, broken-off hairs, covered with small grayish scales, so that the hairs themselves, as well as the skin, appear gray. In ringworm produced by the *megalosporon endothrix*, the patches are apt to be multiple, much more irregular in outline, less sharply defined at the borders, and often there are a few apparently normal hairs persisting throughout the patches.

As the principles of treatment of these two varieties of the disease are the same, I shall consider them together. Not infrequently cases are seen in which the diagnosis of ringworm can be made only with the aid of the microscope.

The older methods of treating this disease consist of:

1. The application of antiseptic fungicidal drugs in ointment or liquid form.

2. The use of irritating applications, such as croton oil, to cause inflammation and suppuration about the hair follicles, so as to loosen the hairs.

3. The extraction of the diseased hairs with forceps, or by other means.

The use of fungicidal drugs is, of course, an attempt to cure the disease by removing its cause.

The use of irritating applications was suggested by the observation that the more inflammatory type of the disease was usually of shorter duration than the type with but little inflammation.

The extraction of the diseased hairs is an at-

* Read before the New England Pediatric Society, January 7, 1916.

tempt to remove as much as possible of the infective agent.

These methods of treatment have been used for many years. Let us see with what success. In Paris, where all children with ringworm of the scalp are segregated in a hospital school and kept there until cured, up to 1903, the average duration of the disease was two years. In London the disease is generally supposed to be of shorter duration, but this belief is probably due to less care in determining whether or not the disease is cured, for in 1909, mark this statement, 186 children were given medical certificates stating that they were cured of ringworm, and in 179 of these, the microscope revealed ringworm fungus.¹ *In other words, less than 4% of these children presenting medical certificates of cure, were in reality cured.* Could any evidence be more conclusive as to the inefficacy of the usual methods of treating ringworm?

An editorial in the *Journal of Cutaneous Diseases*,² states that Sabouraud, in 1896, after four years of exhaustive research upon the ringworm fungus in its clinical aspect, as well as in the laboratory, came to the conclusion that no known treatment would cure ringworm of the scalp, because "even if the chemical nature of the antiseptics be varied, their physical power of penetration is scarcely altered. Whether in solid, liquid or gaseous form, the same mechanical obstacle is encountered, which no one of these agents is able to overcome. *The root of the hair is inaccessible to external antiseptics.*"

You may ask why it is that removing the diseased hairs with forceps does not cure the disease? The answer lies in the fact that many of these hairs are made so brittle by the disease that, with slight traction, they break off, leaving their infected roots behind.

MacKee and Remer,³ in a recent article, emphasize the inefficacy of the older methods of treatment. They believe that in New York City, in affected children, the disease usually remains more or less active until puberty, when it disappears spontaneously.

These statements certainly seem to show that the older methods of treating this disease were far from ideal. What, then, is the new method of treatment, and what results have been obtained by it in recent years?

The new method is treatment by means of x-rays. In truth, it is not very new, having been used in Paris as a routine measure for the past 12 years.

To go back, it was after Sabouraud's pessimistic statement, quoted above, that he made a wide search for some agent capable of causing temporary baldness. He experimented with both chemical and bacterial toxins, and in 1904, after much experimentation, he began to use the x-ray as a means of causing complete temporary alopecia, and his results from the beginning were brilliant beyond expectation.⁴ The average stay of each child in the hospital, for-

merly two years, was soon reduced to three months, and this alone meant a saving of \$80,000 a year to the City of Paris.⁵ Furthermore, as Sabouraud had predicted, the number of cases of ringworm in Paris has greatly decreased.¹

Probably the most difficult problem connected with the use of x-rays that Sabouraud had to solve was the measurement of the amount of rays the patient received. This difficulty was overcome by the invention of a new radiometer.⁶

This radiometer consists of a paper disc coated with an emulsion of platino-cyanide of barium in a collodion of amylacetate. This preparation has the property of changing color under the action of x-rays in proportion to the quantity of the rays absorbed. Consequently when an exposed disc of this sort is compared with a scale of colors the amount of radiation given may be measured.

Sabouraud places the patch to be treated at a distance of 15 cm. from the centre of the focus tube, and at the same time places the paper disc 8 cm. from the centre of the tube. When the disc has taken the color corresponding to tint B. on the color scale the operation is finished.

In a patch treated in this way, no change is visible until the seventh day, when a slight erythema appears, lasting a few days. On the fifteenth day the hair becomes loosened and falls out.

As the x-ray is not destructive to the fungus, shampoos and the use of antiseptics are kept up to prevent possible reinfection of other parts of the scalp. Two months after the x-rays have been applied, the hair begins to grow again on the treated patch.

Sabouraud's successful treatment of ringworm with x-rays was soon appreciated all over Europe, and it was not many years before most of the European clinics adopted this method as a routine method of treatment, with the result that in several European cities, ringworm of the scalp has become much less frequent. However, it is only within the past few years that this treatment has been used to any extent in hospitals in the United States, and, when used, the results have often been unsatisfactory on account of improper technic. The most frequent error is under-exposure, resulting in the failure of the hair to fall out. This error is caused by improper methods of measuring the rays and the consequent fear of over-dosage. There have also been cases of permanent alopecia resulting from over-exposure, also due to faulty technic.

Furthermore, Sabouraud's pastilles, to measure the rays, when used in this country, do not seem to have given satisfaction in every case, many operators feeling that their use requires too delicate perception of color changes. At the present time the Corbett radiometer, a modification of Sabouraud's radiometer, is used in Dr. Fordyce's clinic in New York.³

In the early days of x-ray treatment of ringworm of the scalp, accidents such as permanent

alopecia were not uncommon, but at present, with a skilled operator, reliable apparatus and a technique which has been perfected, there is little reason to fear bad results. It has been abundantly demonstrated that there is nothing to fear as to possible injury to the brain or to the general health.

With the Coolidge tube now coming into use, far more accurate measurement of the rays is possible, and it seems as if there were no further excuse for us if we do not give our ringworm patients the benefit of x-ray treatment.

You may well ask whether ringworm is a disease common enough in America to demand the establishment of special means of treatment. It is exceedingly common in New York City,³ according to MacKee. In Boston, the average annual number of cases for the past ten years, in the Massachusetts General Hospital Skin Out-Patient Department, was 63; at the Boston City Hospital Skin Out-Patient Department, 40. This makes an average of 103 cases of ringworm of the scalp, each year, in these two hospitals alone, an ample number to justify the demand for modern treatment. During the past few years a beginning has been made at the Massachusetts General Hospital, and it is hoped that before long our larger hospitals, at least, will be equipped to treat all patients referred to them for treatment of ringworm of the scalp. As far as I am aware, no other hospital in New England has as yet adopted the x-ray treatment of this intractable disease.

SUMMARY AND CONCLUSIONS.

1. Ringworm of the scalp is a highly contagious disease.

2. The older methods of treating ringworm of the scalp are inefficient.

3. The treatment of this disease with x-rays, placed upon a practical basis by Sabouraud and Noiré, has proved to be highly efficient. In Paris it has shortened the course of the disease from two years to three months.

4. The objection to the use of x-rays in ringworm, on account of the possibility of producing permanent baldness, owing to inability to measure the rays properly, seems to be answered by the introduction of the Coolidge tube, with which the amount of rays absorbed can be measured with great accuracy.

5. Radiologists as well as dermatologists, in the United States, have been slow to grasp the importance of the x-ray treatment of this disease, but it is to be hoped that, before long, all cases will be treated by this method, which, while it probably will never eradicate the disease, should make it much less frequent in the future than in the past.

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RESULTS OF OPEN-AIR TREATMENT OF PNEUMONIA IN CHILDREN.*

AN ANALYSIS OF 1500 CASES OF LOBAR PNEUMONIA FROM THE RECORDS OF THE CHILDREN'S HOSPITAL, BOSTON.

By A. R. CUNNINGHAM, M.D., BOSTON.

FOLLOWING the suggestion of Dr. J. L. Morse an endeavor has been made in this article to analyze a large series of cases of lobar pneumonia, and to compare the results of treatment of lobar pneumonia in infants and children before and after the introduction of the open-air method. In doing this we had at our disposal, in the records of the Children's Hospital, Boston, over 1500 cases beginning in November, 1870, and ending in July, 1915, the diagnoses being all made by competent men on the visiting staff. As nearly as we could determine, the open-air treatment at this hospital was begun in the latter part of 1905. At the old hospital, where all but about 200 cases were treated, the open-air treatment was given in a room made over from a small dining-room, where there was one very large window reaching to the floor and opening by sashes sliding up and down. There was a transom in the door, and the room accommodated two beds. There was a good deal of sunlight as the window faced southeast, and in the winter months, when most of the cases occurred, the air was apt to be pretty cold during some part of the treatment. When there were more than two such patients they were kept in the large ward with their beds arranged beside an open window, but previous to 1906, when pneumonias were kept in the large ward, there was always a great deal of air space. In the new hospital, lobar pneumonia patients have been out doors practically all the time until after the febrile period.

The treatment in the old series prior to 1906 was apparently very similar to what it is today, except for the addition of free ventilation; brandy and strychnine were the favorite stimulants, baths and sponges were frequently mentioned and morphine and heroin were used as sedatives. In one or two instances patients were put in cotton jackets, swaths were used when the pain was severe, no poultices or such applications were mentioned as being used.

Coolidge and Townsend,¹ in their analysis of one thousand cases at the Massachusetts General Hospital, published in 1889, wrote a very interesting paper and criticism of the use of hospital records for statistics without further analysis of cases, and in this report we have endeavored to avoid, as far as possible, the influence of such factors as might lead to false impressions. The brief notes written on some of the earlier cases made it harder to avoid these factors. Tempera-

* Read at a meeting of the New England Pediatric Society, January 7, 1916.

ture charts began to be included with the records at about 1884, and records of pulse and respiration were regularly entered about one year later. The difference in mortality in the first three to four years was so marked in this series that the mortality had to be calculated for each age, thus partly nullifying the advantage of large blocks of cases.

TABLE I.

Age.	PREVIOUS TO 1906.			AFTER 1906.		
	Cases.	Deaths.	%	Cases.	Deaths.	%
0-1	34	11	32.3	66	20	30.3
1-2	98	19	19.3	130	26	20
2-3	151	10	6.6	115	5	4.3
3-4	123	6	4.8	98	15	15.3
4-5	75	4	5.3	66	4	6
5-6	78	2	2.5	57	1	1.7
6-13	315	4	1.2	134	7	5.2
Total	874	56		666	82	

Table I includes deaths from all causes which were secondary to the pneumonia, and shows a considerably higher death rate since 1906. The records of the fatal cases were again looked over and certain ones thrown out. It was found in this examination that several cases in both series were in a moribund condition at entrance; these and all that were obviously much undernourished or that were handicapped by some previous exhausting condition were the bulk of those excluded from Table II.

TABLE II.

Age.	PREVIOUS TO 1906.			AFTER 1906.		
	Cases.	Deaths.	%	Cases.	Deaths.	%
0-1	29	6	20.6	57	11	19.3
1-2	91	12	13.1	121	17	14
2-3	147	6	4	112	2	1.7
3-4	123	6	4.8	93	10	10.7
4-5	75	4	5.3	63	1	1.6
5-6	77	1	1.3	56	0	0
6-13	313	2	0.6	131	4	3.0

Table II is not so unfavorable to the later period as Table I, and seems to us to represent more nearly true comparisons. In a series of 118 cases seen at the Infants' Hospital from 1895 to 1904 Morse² found a total mortality of 26.3% or a mortality during the first year of 36% and during the second year 19% without excluding any cases. These figures are very close to our figures in Table I. Townsend³ collected ten series from various writers, including himself, and totaling 1130 cases in children, in which the mortality was 2.4%, considerably below our mortality of all the cases of two years up (3.0% at best). His figures also probably included some infants (below 2 years) and were published in 1889; they were, however, mostly taken from reports of private practitioners in England. He remarks that "The prognosis in uncomplicated lobar pneumonia in children and infants, with the exception of those under two to three months, or in those who are debilitated, is always favorable."

No improvement in the mortality is shown since the institution of open-air treatment.

Hoping to show a reduction in the percentage of empyema, the cases having that complication were gone over and Table III was made up excluding those in which there was probably fluid present at entrance.

TABLE III.

Age.	PREVIOUS TO 1906.			AFTER 1906.		
	Cases.	Deaths.	%	Cases.	Deaths.	%
0-1	34	1	2.9	64	3	4.7
1-2	94	3	3.1	129	4	3.1
2-3	147	2	1.4	113	5	4.4
3-4	121	5	4.1	97	3	3
4-5	75	1	1.3	65	2	3
5-6	78	1	1.3	57	2	3.5
6-7	70	0	0	49	2	4
7-8	64	0	0	31	1	3.2
8-9	54	0	0	21	0	0
9-10	49	1	2	14	1	7.1
10-13	77	4	5.1	19	1	5.2

This shows percentages almost uniformly less satisfactory since the institution of open-air treatment. It was interesting to note in this connection that in the earlier cases patients with signs of fluid following pneumonia were held much longer on the medial side than at present, and thoracentesis was done very tardily. One child was in very weak condition and was found to have a bilateral empyema. In this case it was unsuccessfully attempted to drain the pus by repeated thoracentesis on account of her general condition. Another was cured simply by removing a small quantity of pus once by thoracentesis. There can be no doubt from these statistics that the results of open-air treatment as practiced in the last ten years have not come up to the expectations and it seems reasonable to believe that they are worse than those of the preceding ten years. It is to be remembered that the older cases were receiving a very good grade of air, although warm, and most of those since received fresh and sometimes very cold air, the difference in treatment being one of temperature. We conclude, therefore, that the air used by pneumonia patients should not be very cold.

The comparison of the febrile periods, as they averaged for cases in each year of life, showed a longer period during the first two years, this figure being a fraction over eleven days. Morse's² figures for this age showed a period of 8.1 days. The average duration of fever for all ages before 1906 was 9.1 days, while since then it has been 8.7 days. The onset, as mentioned in 1148 cases, was sudden in 785 or 68.4%. The most constant and marked symptom was vomiting, which occurred in a very large percentage (60%) of the cases. Cough was commonly present, abdominal pain was mentioned in 14.6% of the cases, meningeal symptoms in 8% (either convulsions or lesser disturbances, such as rigidity and tenderness on

motion of the neck, strabismus, etc.) and herpes of the lip or face occurred in 130 cases, or 8.7%, affecting the tongue in one instance and occurring as Zoster once. No case younger than 19 months showed this efflorescence.

The temperature, pulse and respiration fell by crisis in 72.4% of the cases. There were several instances of apparent reinfection (1.6%) and many of delayed resolution (4.1%). The most noticeable relation of pulse and respiration was that respiration plus 100 equaled pulse rate. This occurred in 45.5%. Next most commonly the respiration was one-third of the pulse-rate. Together these ratios made up 63.1% and the frequency of their occurrence was striking.

Mild renal irritation was shown in 364 cases out of 897 where urinary examinations were recorded (40.7%). The irritation was marked in 3.3% of these and an acute nephritis with edema and blood in the urine occurred in .7%. None of these cases became chronic, all running a very short course. In our series acute endocarditis occurred only four times, and acute pericarditis only three times. All but one were fatal cases. In the large series of 949 cases analyzed at the Boston City Hospital by Sears and Larrabee,⁴ pericarditis was diagnosed in 19 cases, of whom 11 died; in these it seemed to be only an "incident in a general pneumococcus septicaemia." It was found 8 times in 72 autopsied.⁶ Acute endocarditis was present in only a few cases; a murmur was often heard but rarely persisted, it was shown in 9 of the 72 cases autopsied, and was mostly aortic (*ibid.*). Osler⁵ found it in 16 out of 100 cases; simple in 5, and ulcerative in 11. Of 209 cases of malignant endocarditis he found that 54 occurred in pneumonia. Holt⁶ says that endocarditis is extremely rare; it was not observed in any of his cases. Purulent otitis media occurred in 13.1%. No catarrhal cases were considered. Various other complications occurred, none in more than .5%, except tonsillitis, which occurred with an exudate in 3%; conjunctivitis in 5%, and rhinitis in 11%.

The left lower lobe was involved in	565 cases
The right " " " " " "	500 "
The right upper " " " " " "	440 "
The left " " " " " "	220 "
The right middle lobe was involved in	60 plus
Two lobes were involved in	195 cases
Three " " " " " "	65 "
Four " " " " " "	8 "
Five " " " " " " successively	1 case

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¹ Coolidge and Townsend: American Climatological Assn., June, 1889.

² Morse, J. L.: Read before American Pediatric Soc., Detroit, May, 1904.

³ Townsend: In Archives of Pediatrics, 1889.

⁴ Sears and Larrabee: St. Paul Medical Journal, 1902.

⁵ Osler: Modern Medicine.

⁶ Holt: Diseases of Children.

THE PROBLEM OF TUBERCULOUS INFECTION IN CHILDREN.

By HAROLD W. DANA, M.D., BOSTON.

Second Assistant Visiting Physician, Boston City Hospital.

At the present time a large and an increasing effort is constantly being made toward preventing latent tuberculous infection in children from developing into an active tuberculosis. If we admit, as is generally claimed by experts, that 90% of all children who reach the age of 14 or 15 years, have a tuberculous "infection" as distinct from tuberculous disease; if we agree with the idea that most if not all tuberculosis of later life is acquired during childhood; then the problem would appear to be a very large and a very difficult one. The fact that post-mortem examination shows signs of an earlier (healed) tuberculous focus somewhere in the body, in the vast majority of all cases, and that these "healed" cases added to the active cases make a total of about 90 to 95% of all autopsies showing evidence of past or present tuberculosis, would seem to bear out the truth of the above claims. We are also told that one of the most promising means of combating tuberculosis lies (1) in the effort to prevent the infection of children with tuberculosis, and, (2) in the effort to prevent the production of an active tuberculosis from such infection after it has already occurred.

The discussion would seem to group itself into three parts:

1. What should we like to do if we could?
2. What are we able to do?
3. How can we go about it?

1. Passing over the obvious answer that we should like to abolish all disease, we might hope, (a) to reduce the percentage of tuberculous infection, and, (b) to prevent the conversion of this latent tuberculosis into a frank tuberculosis.

2. Of the things that are possible to do: we can probably abolish that part of the infection with tuberculosis which is acquired through the use of milk as a food; we can diminish the contact between children and active cases of tuberculosis; we can follow up any child exposed by association with any known case of tuberculosis; we can, to a greater or less extent, pick out those children who have become infected; and we can watch these infected cases to prevent them from becoming active cases, treating those whose general condition fails to improve, by more energetic measures.

In August, 1914, the trustees of the State Hospitals for Consumptives sent out to many of the physicians of the state, a circular letter dealing with the question of tuberculous infection. Apparently this letter met with but little response, since but few such cases were reported to the State Board of Health, as was requested in the letter. As was stated in this circular,

however, the matter really rests with the general practitioner, rather than with the tuberculosis experts. Personally, this matter of the recognition and proper handling of cases of tuberculous infection seems to be one of the most difficult parts, if not the most difficult part, of the problem, and I am going chiefly into that phase of the subject.

3. Better milk laws and a cleaner milk supply will diminish, if not abolish, milk-borne infection; earlier diagnosis of active cases of tuberculosis; better sanitary control of these patients at home; preventing the contact between such patients, and their children; and the removal of advanced cases to hospitals, will diminish the tuberculous infection of children to an increasing extent. What about the cases already infected?

For the past three years I have had considerable opportunity to examine school children. For the past year I have been studying the relation between the physical findings and the x-ray reports in cases showing probable tuberculous infection. Results have not been very satisfactory, and the further that I have studied the subject, the less qualified I have felt to decide on any definite course of action. Unfortunately, most of the x-ray men and the tuberculosis experts with whom I have talked have been unwilling to lay down any rules to apply to these cases. It is not very difficult, in many cases, to say that a child has enlarged bronchial glands, or perhaps that the glands are probably tuberculous, but when you have said it, what are you going to do about the case?

The medical inspection of school children has been even less satisfactory as far as results went. Sometimes I have called the cases, in which I suspected the presence of a tuberculous infection, by the name of "pre-tuberculous," sometimes I chose "malnutrition," or "anemia," or "improper hygiene," as titles under which to report such cases to the parents. As a usual result, the family was put to the expense of taking the child to its own physician, who told the parents that the child did not have whichever one of the conditions I had happened to select as a diagnosis for that particular case. Hence the family had spent its money, had been told that the child was perfectly well, and had been annoyed into the bargain, without anyone being benefited at all. Yet the teachers, in general, agreed with me that these children were below par, were feeble, lacking in vitality, and were unable to study like the other children.

My most satisfactory results were obtained by getting the teacher to visit the family, and suggest improvements in sanitary and dietetic conditions in the home, or by getting the teacher to invite the parents of the children in question to come to the school, so that I might go over the needs of each case with each mother. Speaking quite casually, I should say that an intelligent, alert and interested teacher, who had had the

chance to observe her pupils for several months, can, in many cases at least, say quite definitely which children are in need of treatment for latent tuberculosis.

In other words, while I do not mean to say that all cases of tuberculous infection can be found by any such simple means, I do feel very strongly, that any child showing, as constant symptoms, listlessness, or pallor unnatural to that particular child, or poor nutrition, or fever, or recurrent cough, should be treated fairly actively for tuberculosis.

Of open-air schools and open-air rooms in schools we shall in time perhaps have enough for all who need it to have such accommodation; regarding the desirability of open-air schools, however, not all physicians are agreed. The much-discussed question, as to whether schools should feed their pupils free, is to be answered largely in terms of how great is our desire to cure these cases. There again, as in all parts of the fight against tuberculosis, and as in many other conditions which we should like to abolish, the question of first cost comes up. While I am not an apologist for the nourishing of school children, as such, at the public expense, it would economically be undoubtedly cheaper to feed these infected cases than to allow them to develop into frank tuberculosis. It does seem to me, however, that it should be part of the work of the tuberculosis dispensaries, now maintained by law by each town, to make sure that cases of this sort do get sufficient nourishing food. Personally, I should like to turn over to the district nurse, or to the school nurse, such of these children with latent tuberculosis, as seem to be in need of treatment and to have her take these children periodically to the local tuberculosis dispensary for a careful examination and advice as to care at home. Any child whose history shows an exposure to infection, through contact with a known case of tuberculosis, should be periodically examined, regardless of its apparent continued good health.

One of the great difficulties in trying to systematize the work of different men in fighting tuberculosis in children is the lack of a suitable term for the diagnosis of these cases. On the one hand, we do not wish to alarm parents, nor do we wish definitely to call these more or less indefinite cases frank tuberculosis. For this reason many doctors dislike the terms "pre-tuberculous" or "tuberculous infection", which seem to the family to put the "stigma" of tuberculosis upon the child, nor can we make a diagnosis of bronchial adenitis in any large proportion of the cases. On the other hand, the less significant diagnosis, such as "anemia," suggest to the parents a condition of such minor importance that the case is often neglected. It seems to me that unless some clever medical man can offer some new term which means nothing to the lay mind and which means tuberculosis to the initiated, it is better to describe these cases as

"probable tuberculous infection" or "anemia, probably tuberculous" or by some such definite term.

With regard to the custom, which is apparently growing, of making an unqualified diagnosis of pulmonary tuberculosis, based solely upon the x-ray diagnosis of a tuberculous lesion in the chest, I feel very strongly antagonistic. If it be true, as authorities state, that a vast majority of all children have had a tuberculous infection at some time, then we should expect that the vast majority of x-ray pictures of children's chests would show signs of a tuberculous infection, and this is exactly what we do find. In the lung plates of children, made at the Boston City Hospital, the x-ray department is able to recognize signs of a tuberculous process in a great majority. In most instances, however, it is not possible to determine whether the process shown by the x-ray is an active one or not, hence it undoubtedly is overzealous to treat all of these children as active cases of tuberculosis. In other words, unless we are going to admit that all the people in the world, young and old, are in need of active sanitarium treatment for tuberculosis, we must use judgment in distinguishing between the active and the inactive cases.

While the following table gives the result of only a relatively small number of fairly careful examinations of school children, forty per cent. of them were examined more than once, and almost all of them were under my constant observation for three school years. The table covers a period of four school years in all, but does not include the result of any examinations of these same children by other examiners during this period.

TABLE.

Number of children examined.....	801
Number of annual examinations.....	1263
Number of children found to have probable tuberculous infection.....	97
Percentage of children infected.....	12.1%
Number of children examined only once (four years).....	467
Number of children examined twice (in three years).....	206
Number of children examined three times (in three years).....	128

CONCLUSIONS.

1. A large proportion of all children are infected with tuberculosis during childhood, and from this early infection most of the active tuberculosis of later life is believed to spring.

2. The general practitioner has not been interested in the diagnosis of these cases, and he has not awakened to the practical importance of such cases in the fight against tuberculosis. In fact he tends to deny the existence of such cases.

3. It is a safe general rule to follow, that any child who shows constantly poor nutrition, fever, lack of vitality and ambition, abnormal pallor, or who is in other ways "below par", should have the benefit of fresh air and abundant suitable food, as well as frequent careful physical examinations by an expert.

4. Such cases should be sought for by the school physician, and when found, should be followed along by the school or district nurse, who can take these patients to the local tuberculosis dispensary at stated intervals for examination. This need not necessarily interfere with the care of these patients by their family physicians.

5. The x-ray does not distinguish, in general, between active cases needing active treatment, and the latent or healed cases.

Reports of Societies.

NEW ENGLAND PEDIATRIC SOCIETY.

MEETING HELD AT THE BOSTON MEDICAL LIBRARY,
JANUARY 7, 1916.

The President, DR. A. C. EASTMAN of Springfield, in the Chair.

The following papers were read:

1. "Presidential Address," A. C. EASTMAN, M.D., SPRINGFIELD.
2. "Indigestion with Fermentation," J. I. GROVER, M.D., BOSTON.
3. "The Problem of Ringworm in Children," E. LAWRENCE OLIVER, M.D., BOSTON.
4. "Results of Open-Air Treatment in Pneumonia," A. R. CUNNINGHAM, M.D., BOSTON.

DISCUSSION.

DR. DUNN, (Dr. Grover's paper): I was very much interested in one or two features of Dr. Grover's paper. One was the result of the microchemical findings in the stools. The disturbance caused by carbohydrate fermentation is a very common condition, and is very apt to lead to mistakes in diagnosis, because we get to depend, sometimes, too literally on the results of the microchemical examination of the stools and assume that the condition is one of fat indigestion because the stools continuously show an excess of soap, when really it is a case of carbohydrate intolerance. Also it seems as if with a great many of the severe cases of disturbed nutrition which show themselves clinically as cases of fat intolerance, when one goes into the history it seems that carbohydrate intolerance was the primary condition. Last year Dr. Langley Porter and I conducted some experiments by over-feeding babies with lactose, and we found cases in which we could run the lactose up to 12 or 18% in the food without producing symptoms at all, which merely showed that the variations are much more extreme than a great many people suppose. Other cases showed symptoms with very small amounts of carbohydrate.

DR. OLIVER: During the last year, at the Massachusetts General Hospital, we have had twelve or fifteen cases treated with x-ray, with very successful results. Without doubt, this is the best method of treatment, but owing to lack of money or other causes, it has been impossible to obtain this treatment for every case. The hospital is short of tubes,

¹ See JOURNAL, p. 739. ² See JOURNAL, p. 751. ³ See JOURNAL, p. 753.

and I am not sure now that there is more than one Coolidge tube that can be used for treating this disease. If anyone knows of any other hospital in New England where this treatment is now used, I shall be very glad to know of it.

DR. GROVER, (Dr. Oliver's paper): What is the duration of the exposure, seconds or minutes?

DR. OLIVER: The duration of the treatment is minutes. I do not know the exact duration of the time, but it is comparatively few minutes. If there is one small patch, this patch alone is treated; if there are several patches, usually the entire scalp should be treated. If the entire scalp is treated it has to have five different exposures so as not to get too great a dose on any one place, and of course that takes five times as long as treating a single patch. But one treatment to each patch is sufficient to cure the disease in over 90% of the cases.

DR. CUNNINGHAM, replying to the question of Dr. Eastman, as to whether the children had had the open-air treatment both day and night: That was the case here. The children treated at the Children's Hospital received the cold air treatment day and night.

DR. PRATT, (Dr. Cunningham's paper): Personally I have never used the out-door treatment in cases of pneumonia. It takes a pretty proficient nurse to take care of an infant with pneumonia and not have it lose a lot of bodily heat. I generally keep the temperature of the room from 55° F. to 60° F., with a fire in the open fireplace and ventilation enough to give the child plenty of fresh air, and under these conditions the child can be kept comfortable at the same time. I have not lost a case in years with this method of treatment where the home conditions were satisfactory.

DR. HOWELL, (Dr. Cunningham's paper): I think, as Dr. Pratt has stated, that it makes a good deal of difference what one means by cold or fresh air. I do not believe that it means that the patients are to be in as cold air as the outside air; it is a matter of fresh air rather than cold. At the Infants' Hospital we have a pneumonia room, that is, a room which is partitioned off from the end of the ward, with glass, so that the nurses can watch the babies, and the temperature of that room is kept at about 50° with all. If the outside air is cold the steam is turned on. Our lobar pneumonias have done much better and have been much more comfortable, have better color and take their food better, and it seems as if our mortality was less, and it seems that the bronchopneumonia cases also are more comfortable. Some babies with a good deal of bronchitis do not stand the cold so well. If the temperature goes down, the nurse is instructed to close the windows, but we keep them open, if possible. I do not know that our cases have done any better, but it does seem that in the last two years we have had a lower mortality, even in the bronchopneumonias.

DR. CUNNINGHAM, in closing: I would like to say that most of the severe cases of pneumonia which were treated here occurred in the winter months, when the open air was pretty cold. In the old hospital I think there was very little heating in the room that was set apart for those cases, because I understand from the older nurses that they were often very cold. I would also like to emphasize that we compared cases treated with very cold air with those treated with warmed but fairly good air.

JOINT MEETING, PHILADELPHIA PEDIATRIC SOCIETY, SECTION ON PEDIATRICS OF THE NEW YORK ACADEMY OF MEDICINE, AND THE NEW ENGLAND PEDIATRIC SOCIETY.

HELD AT PHILADELPHIA, TUESDAY, NOVEMBER 9, 1915, AT 8.15 P.M. DR. WILLIAM N. BRADLEY IN THE CHAIR.

LOBAR PNEUMONIA; THE CO-RELATION OF ITS SYMPTOMS AND PHYSICAL SIGNS WITH THE FINDINGS OF THE ROENTGEN RAY.

DR. HOWARD H. MASON, New York City: During the past two years all cases of lobar pneumonia on the Children's Service at the Presbyterian Hospital have been Roentgen-rayed at least once. In those cases showing a shadow, but in which bronchial voice and breathing were not heard, repeated Roentgenograms were taken at varying intervals. The purpose of these examinations was to ascertain whether the consolidation as evidenced by this shadow passes through any regular development, and if so, whether the different stages of its progress can be correlated with the development of certain physical signs.

Thirty-seven cases of lobar pneumonia were studied with the Roentgen rays, most of them repeatedly. All thirty-seven cases showed a definite shadow.

The shadow was always so placed that it touched the pleura at some point.

The early shadows were triangular in shape, with their bases on the pleura and their apices separated from the region of the root by normal lung.

In their later development the shadows extended in size and became uniform from the periphery to the root of the lung. When the shadow involved this entire stretch, bronchial voice and breathing were present, but not otherwise. It is believed that the inference is justified that the dimensions of the shadows correspond to the extension of consolidation.

The following conclusions may, therefore, be drawn:

1. The consolidation of lobar pneumonia in children begins in that portion of the lung which lies just beneath the pleura.

2. A central pneumonia, in the strict sense, never occurs. Silent consolidations are subpleural consolidations and are separated from the hilum by normal lung.

3. Bronchial breath and voice sounds are dependent upon the presence of a medium of comparatively uniform density from the site of their origin (the trachea and large bronchi) to the point where the ear or stethoscope is applied. These conditions are fulfilled when the consolidated area extends from just beneath the ear to the region of the hilum.

TUBERCULOSIS IN INFANCY.

DR. CHARLES HUNTER DUNN, Boston: The purpose of the paper is to discuss certain limited aspects of tuberculosis in the first two years of life. I have been impressed from the literature that in many articles the conclusions drawn are not supported by the final proof offered by post-mortem examination. The importance of tuberculosis as a cause of death in the first two years of life is shown by the fact that in a series of 62 successive autopsies tuberculosis was found in 25, was considered

the direct cause in 23 cases and the contributing cause in the other two. Extremely divergent views are held concerning the source of infection and its portal of entry into the body. One set of writers believe that milk infected with the bovine type of bacillus is the most common cause of the disease in infancy, and the intestinal tract or the tonsils the most common portal of entry. Other writers believe the human type of bacillus to be the most common cause and the portal of entry the lungs. The two most important forms of evidence bearing upon this question are (1) that derived from bacteriological study of bacilli obtained from infants by culture or animal inoculation; (2) that derived from a careful study of the lesions found post-mortem. Post-mortem findings show a greater frequency of involvement of the peribronchial and mediastinal lymph nodes than of the mesenteric. Advocates of milk infection try to explain this upon the theory that the bovine bacillus can pass, without causing a lesion, through the intestinal mucous membrane and through the mesenteric lymph nodes, locating in the lymph nodes of the chest as the point of minimum resistance. This theory, I believe to be untenable. The contradictory evidence upon the source of infection and portal of entry can be explained only upon the ground of a variation according to locality. Such variation is probably largely dependent upon the character of milk supplies and the frequency of tuberculous disease in cattle in various parts of the world. I believe that infants can be infected either with human bacilli, usually entering through the lungs, or with bovine bacilli usually entering through the intestine. The most generally accepted view is that tuberculous infection shows the primary lesion in the lymph nodes. In my studies at the Infants' Hospital a primary lesion was actually found at the portal of entry in 22 of the 25 post-mortems. I am, therefore, inclined to believe with Ghon that it is more probable that when a primary lesion is not found at the portal of entry it is overlooked. The primary lesion was found in the lungs in 20 cases; in the intestine, in two. Adding to the 20 cases the three in which the only chronic lesions were found in bronchial lymph nodes, we have a ratio of 23 cases of infection through the lung to two cases of infection through the intestine. Tuberculous ulceration of the intestinal mucous membrane was found in seven cases besides the two in which the lesion was considered primary. I believe it to be a probable conclusion that these tuberculous ulcerations of the intestines are secondary to swallowed tuberculous material coughed up from the softening of the primary lesion. These seven cases with secondary tuberculous ulceration of the intestine were identical with the seven cases in which the mesenteric lymph nodes were involved in addition to the bronchial lymph nodes. I believe my findings to be against the view of the ability of the tubercle bacillus to pass through the intestinal mucosa without leaving traces of its progress in the form of a definite lesion. In the series the diagnosis of tuberculosis was made in 23 out of 25 cases, but these were all seen in the last stages of the disease. Three important points besides tuberculous meningitis or tuberculous peritonitis upon which the diagnosis of tuberculosis in infancy is based are (1) physical signs suggesting tuberculosis in the chest; (2) tuberculin reaction; (3) Roentgen-ray examination of the chest.

THE PRACTICAL VALUE OF THE GUINEA-PIG TEST FOR THE VIRULENCE OF DIPHTHERIA BACILLI, BASED UPON 1054 VIRULENCE TESTS.

By DR. JOHN A. KOLMER, DR. SAMUEL S. WOODY AND DR. EMILY L. MOSHAGE of Philadelphia.

DR. KOLMER: The necessity, in the practical management of diphtheria and healthy "carriers" of diphtheria bacilli, for some method of determining the possible harmfulness of diphtheria bacilli is emphasized. The animal virulence test has been found in our hands the only test for determining the virulence of diphtheria bacilli. Differentiation among diphtheria bacilli by morphological and biological characteristics is not reliable. Experimental data have shown quite conclusively that a non-virulent culture of diphtheria bacilli cannot be made virulent; however, a culture that has lost its virulence to a large extent may be made again virulent by animal passage or by transference from throat to throat among persons. Therefore, we wish to emphasize the necessity of conducting virulence tests in such a manner as to detect the potential harmfulness of cultures of a low degree of virulence. In addition to this prime requisite the test should be conducted in an economical manner and yield its results as quickly as possible.

Dr. Moshage and I have experimented during the past year with various methods of determining in a practical way the virulence of diphtheria bacilli. As a result of these experiments we have found that the subcutaneous injection into 250 to 300 gram guinea-pigs of 4 c.c. of a 24-hour Loeffler culture washed off with 10 c.c. of sterile salt solution, yielded best results; the subcutaneous injection of 72-hour serum dextrose bouillon cultures likewise yielded good results. The intracutaneous test was found less serviceable for detecting the pathogenicity of cultures with low virulence and the reactions were more difficult to read.

With the subcutaneous method we have conducted 1054 virulence tests in the Philadelphia Hospital for Contagious Diseases.

Cultures of the granular or beaded and barred types of diphtheria bacilli from the throat, nose and ear yielded about 72 per cent. positive results; cultures of the long solid types were virulent in about 42 per cent. of cases; cultures of the short solid types yielded uniformly negative results. In practical work we regard the granular and barred types of bacilli as dangerous, no matter how long they persist on a mucous membrane after recovery from diphtheria. Of all types they are most likely to remain virulent and should be so regarded until proven otherwise. The animal inoculation test is of particular value in dealing with cultures of the solid types. For several years I have disregarded the short solid types in cultures when I was sure that the bacilli belonged to this variety; in the Philadelphia Hospital for Contagious Diseases virulence tests with organisms of this type have been uniformly negative in such a large number of cases that we regard this bacillus as practically harmless. We are of the opinion that in many instances the bacilli found on a mucous membrane after recovery from diphtheria were present before the attack and are likely to remain for an indefinite time afterward, yielding a long line of positive cultures which will require quarantining over a long period of time, unless the culture is submitted to the virulence test. If the physician will take cultures carefully, conscientiously and freely, especially several cultures,

before excluding the diagnosis of diphtheria in a given case, and if three consecutive negative cultures are required instead of two before quarantine is lifted, combined with the efforts of the bacteriologist to differentiate between virulent and non-virulent bacilli with the judicious use of the animal inoculation test in suitable cases, we believe that the bacteriological diagnosis and management of diphtheria will be efficient and satisfactory to all.

AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY.

SIXTH ANNUAL MEETING. HELD AT THE BELLEVUE-STRATFORD HOTEL, PHILADELPHIA, NOV. 10-12, 1915.

DR. CHARLES A. FIFE of Philadelphia in the Chair.

THE STATISTICAL STUDY OF RESPIRATORY DISEASES AS A FACTOR IN THE CAUSATION OF INFANT MORTALITY.

DR. WILLIAM C. WOODWARD, Washington, D. C.: The importance of the part played by diseases of the respiratory system in causing deaths during the first year of life has been to a very considerable extent overlooked. The extent to which such deaths are preventable by any practical method or methods now known remains to be determined. Machinery having been organized and methods adopted for the prevention of diseases of nutrition, including diseases of the digestive tract, through "infant consultations"; and for the prevention of still births and deaths due to complications of labor and diseases incident thereto through the same agency and through prenatal nursing; the next step to be taken toward the lowering of infant mortality should be directed toward the establishment of machinery and the adopting of at least tentative methods for the prevention of respiratory diseases.

In the registration area of the United States in the calendar year 1913, diseases of the respiratory system caused 15.85% of the total mortality in the first year of life. A propaganda against diseases of the respiratory system as a factor in infant mortality is fully justified by the position they occupy. The mortality from diseases of the respiratory system in the first year of life constituted in the registration area in the calendar year 1913, approximately one-quarter of the total mortality from these diseases at all age-periods taken together. One-quarter of the total mortality from diseases of the respiratory system lies, therefore, within the purview of the agencies for the conservation and promotion of infant welfare, and a campaign against diseases of the respiratory system in infancy will form an important factor in any campaign that may be inaugurated against such diseases generally. Bronchitis and pneumonia together caused 95% of all deaths in the first year of life due to diseases of the respiratory system. Deaths from diseases of the respiratory system apparently occur to a greater extent during the third week of life than during any other weekly period, while the heaviest month's toll was levied in the first month of life,—a percentage of 18.62. The prevention of deaths in infancy from diseases of the

respiratory system is, therefore, a task for the prenatal nurse, the obstetrician, the midwife, the pediatrician and the infant welfare station.

THE PREVENTION OF RESPIRATORY DISEASES.

DR. ROYAL STORRS HAYNES, New York City: In the prevention of respiratory diseases, two important factors are destruction or exclusion of the infecting organism, and preservation of the resistance. Transference by contact is the method of infection in most instances, and this may be avoided by real cleanliness. In connection with the second factor, the preservation of a perfectly functioning vasomotor system is of the greatest importance. In the prevention of respiratory diseases I would suggest the appointment of a committee on the prevention of respiratory diseases, among the duties of which should be: (a) supervision of the conduct of an intensive investigation of respiratory affections in a selected area in a selected city. Such an investigation should be able to determine with some accuracy the relative importance of various factors in the etiology of the diseases and the value of prophylactic measures. It would embrace the work of social workers, physicians, physiologists, sanitary engineers and bacteriologists; (b) to arrange for the publication of articles in the medical and lay press dealing with the importance of these affections, acquainting the laity with the loss of time, money, health and life which the diseases cause; (c) to investigate the health laws of the various States, with the view of determining the present legislation upon these subjects, and, where desirable, to improve it; (d) to inaugurate an educational campaign by lectures for those which the printed articles will not reach; (e) to stimulate the care of the child before entering the school age by laying greater emphasis upon his medical supervision between the milk station and school age.

THE TREATMENT OF RESPIRATORY DISEASES, WITH SPECIAL REFERENCE TO THE VALUE OF FRESH AIR.

DR. JOHN LOVETT MORSE, Boston: There is much confusion among writers in the use of the term "fresh air," some apparently meaning pure air without regard to its temperature; others, cold air without regard to its purity; others, air which is both cold and pure. It was formerly supposed that the discomfort felt in a close room was due to the presence of toxic organic constituents from the breath or to an excess of carbon dioxide in the air. The weight of evidence seems to show that the expired breath contains very little, if any, organic matter, and it has been proved that symptoms experienced in a badly ventilated room are not due to poisons excreted in the breath; also that people can breathe for many hours, without discomfort, air containing a very much larger proportion of carbon dioxide than is ever present in a room, provided that the temperature of the air is low and that it is in motion. In view of experiments, fresh air may be defined as air which is cool, dry and in motion. Cool air is not cold air. The action of the latter may be divided into that upon the respiratory mucous membrane and its effect upon the system as a whole. The conclusions of my own observations are that in the early stages of acute nasopharyngitis cold air increases the irritation of the mucous membrane; but in the later stages relieves the discomfort to a certain extent. Cold air

predisposes to affections of the ears; fresh air is of advantage. In acute laryngitis cold air has a strongly irritant action upon the inflamed mucous membrane; cold air is not indicated, but does not harm in the later stages. In the early stages of acute bronchitis cold air increases the cough and the sense of constriction of the chest and of heat under the sternum. The cough is less troublesome when the air is moist than when dry. In very acute bronchitis associated with dyspnea and cyanosis, the contraindications to the use of cold air are the same as in the milder cases, and the only possible advantage of cold air is as a vasomotor stimulant, and it is problematical whether this action is of value. In bronchopneumonia there is no contraindication to the use of cold air, but there is no advantage unless there is a vasomotor paralysis, and here the advantage is also questionable. Children with bronchopneumonia are, however, unquestionably benefited by fresh air. In lobar pneumonia the stimulant effect of cold air is of value. Children, therefore, with this disease should be treated out of doors or near open windows. While children so treated are more comfortable, it is questionable whether the mortality of lobar pneumonia has been materially lessened by cold air treatment. It may be said that fresh air is of advantage in the treatment of all diseases of the respiratory tract. It is also of advantage to have pure air. Cold air is of advantage in some conditions, but harmful in others, and must be used with discretion.

DISCUSSION.

DR. L. EMMETT HOLT, New York City: We can not too strongly emphasize the importance of quarantining the infant when other members of the family have colds. This particularly obtains in connection with premature infants. Against the contagiousness of pneumonia our efforts must be directed largely to raising the resistance of the infant. There have been almost as many deaths caused by cold air as there have been cures effected. I think, with Dr. Morse, that cold air is a means of treatment to be used with great discrimination. I have seen a great amount of harm done by the treatment of acute respiratory diseases, especially in young infants, by exposure to cold air.

DR. S. McC. HAMILL, Philadelphia: The gentlemen who have spoken have given us the foundation upon which we should build in our fight against infant mortality, and I feel that we owe them an expression of sincere gratitude. I have nothing to say in criticism, but I do think it necessary to say a word of caution in regard to two phases of Dr. Haynes' paper: (1) In the use of vaccines in the prevention of colds. It seems to me that the whole question of vaccine therapy is so much "up in the air" at the present time, the dangers connected with its use so manifest, that the subject should never be presented to an audience, especially one composed largely of laymen, without a word of caution against its promiscuous use. (2) While I agree thoroughly with Dr. Haynes concerning the results which have been obtained by the use of the nasal douche in the prevention of the common cold, I think that here again a word of caution should be given, because the promiscuous use of any form of nasal douche is apt in the final analysis to do more harm than good. I am in entire sympathy with Dr. Morse in believing that the use of fresh air has been incautiously employed. When Dr. Morse says that

in the treatment of all conditions, the individual, and not a group of cases, should be treated, he has said practically everything that is essential in this connection. Dr. Morse defines fresh air as cool, dry and moving air. I believe that the proper way to obtain this is through the open windows, and not by a ventilating system. This is especially true in the homes of the poor, in which class of society diseases of the respiratory system are especially prevalent.

DR. J. P. CROZER GRIFFITH: It never has been proven to my mind that the universal employment of cold air, or fresh air, or open air, for the treatment of pneumonia or other respiratory diseases was the correct measure. When I ventured to make this statement a number of years ago, I stood without any spoken support, and I am glad to note the changed sentiment. The question arises, Why this change? We are subject to the failings of human beings, one of which is the following of fads. The excessive use of cold air for the treatment of respiratory diseases has been a fad and has gone beyond the medical profession into the hands of nurses, hospital managers and the laity in general. If among medical men there is doubt concerning the cases in which this treatment may be used, certainly the measure is not safe in other hands. I am a believer in fresh air for many diseases of the respiratory system, but it must be used with the greatest judgment. I agree with Dr. Holt that we see cases that are made worse by its indiscriminate use. We see others which improve only by this treatment.

DR. CRESSY L. WILBUR, Vital Statistician, New York: The foundation of the work for the prevention of mortality is the registration of births and deaths. It is a shame to this country that the births of its infants are not registered. The only exception to this lack is in the state of Pennsylvania, and I want to congratulate the people of this commonwealth and municipality upon their influence in compelling legislation in this matter.

DR. PISEK, New York: I think that fresh air and exposure to cold should be differentiated that there may be no confusion in the minds of nurses and social workers upon this apparently unsettled question.

DR. EMERSON, New York City: Respiratory disease incident to the epidemic of measles which swept over our city in the present year, will give a higher infant mortality than at any previous time. The death rate in the hospitals has been larger than in the homes where the children were cared for by the visiting nurse and physicians. To the question that might be asked, why the children were taken into the hospitals,—there were no homes in which they could be kept, the mothers being away at work. It has become a rule that no children of this age are to be referred to hospitals unless the home conditions make this necessary. The influence of prenatal care upon the resistance of the young child should be emphasized.

DR. HOOVER: I gathered from the discussion that the writers of the papers speak of two groups of cases; one which did well and one which did not do well out of doors. I think it is possible to classify these by observation. If it is found that a child's hands and feet are cold and that it is uncomfortable, regardless of the amount of clothing it has on, we may be certain that such a child will

do better in the ward. A child perfectly comfortable and breathing well in the ward, but who becomes dyspneic when taken out, should be returned to the ward.

DR. ABRAHAM JACOBI, New York City: A good deal of what I have heard this morning has convinced me that some sixty years ago when I began teaching I was not quite so stupid as I took myself to be twenty-five or thirty years afterward. I was of the opinion, as has been expressed this morning, that to speak about the treatment of pneumonia is a misnomer. The several pneumonias are not one and the same thing. In teaching on this subject I always tell my students that they have a patient to deal with. The principal thing in diagnosis, and in the head of the doctor, is brains. Unless every case is studied individually you will not get your patient well. So long as the doctor is not able to impress his nurses with the fact that he is their superior in knowledge, that he knows what he is about in a given case, the nurses will be his superiors in the management of the case, and he will be in the peculiar situation of being run by the nurses and the hospital managers.

DR. WOODWARD, closing: I am disappointed in the trend of the discussion, which has been upon curing pneumonia rather than upon preventing pneumonia and diseases of the respiratory system. Prevention is summed up in the matter of clothing, housing, exercise and personal cleanliness. When this Association can present these four factors to those responsible for the care of babies and children we may hope for a reduction in diseases of the respiratory system.

DR. HAYNES, closing: In connection with Dr. Holt's remarks on the infection of the nursing child by the mother, I have in mind an infant who was nursed by its mother who had whooping cough, without taking the disease. This was because the mother knew how to be careful. I recollect another case in which cleanliness and care prevented the infant taking whooping cough when every member of the family had the disease. In the matter of cold air, I agree that fresh air hurts no one, that possibly cold air does not hurt any well individual. It becomes a question to choose what ill children should be subjected to cold air, and their passivity should be considered in this decision. Dr. Morse spoke of the dryness of fresh air. The dryness should be qualified. I agree with Dr. Hamill regarding the vaccines and postnasal douching. I did not recommend in my paper that these methods of treatment should be used, but said that they were employed.

DR. MORSE, closing: The question concerning the difference between cold and cool air is a rather difficult one to answer, but in general it may be said that a temperature of fifty is cold and one above that is cool. I wondered whether the gentlemen who spoke upon quarantining the baby realized what a hole they were getting the doctors into. If the patients have to be isolated from the children coming from school, the nurse with a cold discharged, logically the doctor, when he has a cold, would have to give up his practice and his income. In reference to deciding by the thermometer in the morning rather than by the calendar, how to dress the children, it should be remembered that in Boston it is impossible to tell in the morning what kind of clothing will be needed in the evening. Upon the matter of fresh, pure, and cold air, it seems to me that a child ought to have fresh air and pure air, and that

the temperature of this fresh pure air, should be regulated in relation to the disease and the individual patient.

THE EDUCATION, LICENSING, AND SUPERVISION OF THE MIDWIFE.

DR. J. CLIFTON EDGAR, New York City: The midwife for traditional, social and economic reasons attends about forty per cent. of confinements in this country and is at present a necessary evil. The solution of the question in the rural districts is in the inclusion of midwifery service in rural district nursing, should a physician not be available. In illustration of this we have the proposed course of midwifery in Washington University Hospital in St. Louis. The midwife should never be regarded as a practitioner. Her only legitimate functions are those of a nurse plus the attendance on a normal delivery when necessary. No unlicensed women should be permitted to practise, and even as a temporary measure, only properly qualified women should be granted a license. Even licensed midwives should be supervised by the local department of health as is done in Buffalo, Pittsburg and Providence, the system following closely that in operation in England and New Zealand, where infant mortality is conspicuously low. A recent study of the midwife question in England made by Miss Carolyn V. VanBlarcom, Secretary of the New York Committee for the Prevention of Blindness, has been used as a basis for midwife control in this country.

IS THE MIDWIFE A NECESSITY?

DR. J. M. BALDY, Philadelphia: This country contains several groups of foreigners who have been accustomed to the midwife, and until immigration ceases and these people are evolved into Americans, the midwife will be demanded. The question resolves itself into the proper education and control of the midwife. Results are obtained by meeting existing conditions and improving them. There is no state, city or town in the United States in which, by the passage of laws, it has been possible to eliminate the midwife. Any measurable degree of success has come only through education and control.

PROGRESS TOWARD IDEAL OBSTETRICS.

DR. JOSEPH B. DELEE, Chicago: I am opposed to any movement to perpetuate the midwife. She is a relic of barbarism and her perpetuation demands a compromise between right and wrong. She is a drag upon the progress of the science and art of obstetrics, her existence stunting the one and degrading the other. The foreigner is becoming enlightened upon the value of medical attendance and demanding it. The visiting nurse does an amount of maternity and prenatal work not fully recognized. There are thousands of young physicians who would take cases now cared for by midwives, were it not considered undignified work and also undignified to accept such a small fee for the service. In educating the midwife we assume the responsibility for her, we lower standards and compromise with wrong, and I for one, refuse to be *particeps criminis*.

DISCUSSION.

DR. WILLIAM R. NICHOLSON, Philadelphia: Without inspection of every case we cannot control the midwife. We have in Philadelphia five inspectors, graduates in medicine, who inspect every case after

delivery has taken place. It seems to me that an association of this sort could do an immense amount of good, if its members worked upon a common ground. There appears to be a division of opinion into those who favor the midwife and those who do not. To me the question at issue is the benefit of the women now attended by the midwife. We do not believe that the midwife can be eliminated at present, and all we are doing is carrying out a police supervision,—there is no other word for it. The women are brought to account for any infraction of requirements. We have saved the lives of babies and mothers and improved obstetrics by our work, which may be regarded as a temporary expedient. I believe that if we had a certain number of English speaking, intelligent young women trained to care as nurses for women in labor, we should be able to get rid of a number of the midwives. We have nine such young women who have been in training from six to eight months. They attend lectures given by one of the inspectors, and must see and deliver twenty cases under inspection. This is an experiment which Dr. Baldy has given us permission to try out, and we believe that the results in a year or two will be good.

DR. J. WHITRIDGE WILLIAMS, Baltimore: When you come to face the inspection of midwives in the big cities, unless there is a man at the head of the work like Dr. Baldy, the effort is going to be a miserable failure. One of the greatest advantages in modern obstetrics is the development of prenatal care. Further development of obstetrics lies in the oversight of the woman after confinement, but this pre- and post-natal service involves the work of the obstetrician, the pediatricist and the social service worker. The crux of the matter is the proper education of doctors to be competent obstetricians. We have just begun to understand in this country what the obstetrician is. It is much more than a "man midwife". The man who invented the obstetrical forceps was named Chamberlen. He called himself, Hugh Chamberlen, man midwife. "Man midwife" and "accoucheur" are two terms that raise my ire. The "man midwife" has disappeared and the "accoucheur" is disappearing; what we want is the scientific obstetrician. We can get him only by the development of our medical education. We need a large thoroughly equipped woman's hospital, where everything pertaining to women and child-bearing is studied from the point of view of teaching that which we now know and for the acquisition of new knowledge. Such a hospital has been endowed in Pittsburgh, and this should set the pace for other cities.

DR. S. JOSEPHINE BAKER, New York City: I think this discussion which has been annual for the last five years, is just about as near solution to-day as it has ever been, and this, it seems to me, is because we have failed to get together on the fundamental principles of this whole proposition. My interest in the midwife is solely to make her, as nearly as we can, a fit person to give the mothers and babies their essential care, but it is an absolute impossibility to abolish her in the city at the present time. The situation in regard to their work, particularly in New York City, has been misinterpreted. When Dr. DeLee speaks of the high mortality and morbidity following the work of the midwife, he is, I assume, expressing his personal opinion. The statistics of New York do not bear this out. The mortality and morbidity of mother and baby attended by

midwives is, in most instances, in proportion, less than that among those attended by physicians. We are coming to the better education of the medical student, but in the interim we are doing, just so far as we are able, that which seems the most efficacious and most nearly protects the mother and baby. We ask if you have anything better? Many of you say eliminate the midwife. What we want is a practical, working program that is better than that which we have at the present time. The midwife is being eliminated. We have in New York only half as many as there were seven years ago, as Dr. Edgar has told you. It is probable that this elimination will come about by making the standard so high that none of the ignorant and untrained women can reach it. At present the women will practise whether you want them, whether licensed or not, and it is infinitely better to see that the care given by the midwives is at least adequate. In prenatal work my experience is that the midwife is one of our best co-operators in referring the mother to us for instruction; and, contrary to what has been said, the women do engage the midwife quite as early as women engage the doctor. We are having meetings with the midwives for instruction to them, and they are beginning to look upon the health department, not as something to be feared, but as something which is a very definite help to them. Through such co-operation we believe we shall obtain reforms more effective than those by radical measures.

DR. ARTHUR B. EMMONS, Boston: Nothing is being done in Massachusetts to eliminate the midwife. Our law registers physicians, and if a midwife wants to qualify before the Board of Licensure, she must pass the examination. It is interesting to note that the daughter of one midwife has already done that,—has taken a course in medicine and qualified as a physician. I believe this plan which we have in Boston is an answer to the question of eliminating the midwife. We have been working out a plan of holding prenatal clinics and conferences. From among the graduates of the lying-in hospital we have a number of young physicians who attend these patients, receiving from five to ten dollars, depending upon the section in which the women live. The follow-up work is done by the visiting nurse, and I am satisfied with our results from a medical point of view. I have worked the idea out with graduates in medicine with the thought of its adoption in other parts of the country. Pennsylvania is leading this country in its requirements for medical licensure.

DR. ABRAHAM JACOBI, New York City: The paper of Dr. DeLee is well written but it does not contain anything that has convinced me at all. The paper of Dr. Baldy will carry conviction. Dr. Edgar's paper does not carry conviction this year as it did a year ago. He is going back upon himself a little, and I am very sorry for it. I am interested only in the poor woman of the people. In its last report I read that the Lying-in Asylum of New York has taken care of about 6,000 women, and at the same time I read that 52,997—three less than 53,000 women—have been confined in their homes by midwives. That tells the whole story. Fifty-three thousand in New York City, and more than a million women in the United States must have midwives. If you want to do away with the midwives, let these women who want midwives be satisfied that they are in just such hands as they want to have about them or that they can afford to pay for. I know

what I am talking about, for I have been a midwife myself. I do not know whether you know what a midwife was fifty or sixty years ago. I was midwife at that time at a five or ten dollar fee. I attended the woman through her confinement and I attended the baby. I washed the baby, and I washed it the next day, and for eight to ten days,—nine days was the usual time. I do not know whether you have heard of those antediluvian times.

DR. GEORGE W. KOSMAK, New York City: I differ with Dr. Baker in believing that the problem of the midwife is no nearer solution than when we began this discussion. We have advanced in that those who favored her are admitting that this practice must be eliminated. There is no stronger argument for the elimination of the midwife than the statement that she should be under supervision.

DR. WILLIAMS, Health Commissioner, New York: There is no demand for obstetric hospitals or dispensaries in the rural districts; there is a demand for good midwives. If the midwife is not available, the farmer's wife cannot get anyone but the neighboring farmer's wife to look after her. For myself, I expect to see the midwife in the State of New York for some time, and I intend to see that some such supervision as that developed by Dr. Baldy is established.

The following officers were elected:

President, Dr. S. McC. HAMILL, Philadelphia.

President-elect (1917), DR. W. C. WOODWARD, Washington.

First Vice-President, DR. JOSEPH S. NEFF, Philadelphia.

Second Vice-President, DR. THOMAS MCCLEAVE, Berkeley.

Secretary, DR. PHILIP VAN INGEN, New York.

Treasurer, MR. AUSTIN MCLEANAH, Baltimore.

Executive Secretary, MISS GERTRUDE B. KNIPP, Baltimore.

The next place of meeting, Milwaukee.

ECONOMIC ASPECTS OF INFANT WELFARE.

Joint Session with Philadelphia County Medical Society.

MR. SHERMAN C. KINGSLEY, Chicago, Chairman.

WAGES AND EMPLOYMENT AS FACTORS IN INFANT MORTALITY.

MR. SHERMAN C. KINGSLEY: Districts which have the largest measure of poverty have also a higher mortality from all causes than have localities better circumstanced. It is difficult to assess baby deaths definitely against low income, but poverty involves housing, overcrowding, quality and amount of food, sunlight, air and wholesome leisure for mothers. The infant welfare program has many points in common with that promulgated in the early days of the anti-tuberculosis crusade, and the brilliant achievements of the former have resulted largely through overcoming difficulties of circumstance and environment. The correction has come through wisdom and advice, the gifts of the community taken to the mother and child through the medium of the doctor and the nurse. Among the last trench operations, however, in this warfare, deep-seated and obstinate are difficulties due to inadequate wages. With the baby, as with communities, life and health are purchasable. Figures show that babies of families living in one room have less than half the chance of those living in four; and the infant whose

father receives less than \$10.00 a week has about half the chance of life of the one whose father earns twice this amount. Our life-saving advice to the mother must be accompanied by an industrial order, which gives a living wage to the father.

MATERNITY INSURANCE.

DR. LEE K. KRANKEL, of the Metropolitan Life Insurance Company, New York City: The paper presents an historical account of the development of organized protection for motherhood, showing that, from the 13th century provision, either in the home or in hospitals, was made under the auspices of philanthropic agencies for the care of indigent women in childbirth. Changed industrial conditions have necessitated legislation protecting women working prior and subsequent to maternity. In practically all European countries such legislation has been enacted under which women are forbidden to work for periods varying from two to six weeks before and after confinement, while in the United States in only four States has such legislation been established. These States are New York, Vermont, Massachusetts, and Connecticut. The next logical step to this compulsory legislation was the development of a scheme of insurance for the lying-in period to replace the wages lost, and such schemes of insurance have been organized in nearly every European country. In Italy alone has the insurance plan developed as a distinct maternity insurance to which both employer and employee contribute. In other countries insurance against maternity is a phase of general sickness insurance, the dues being paid by all members of the scheme. It has been estimated that under a sickness insurance scheme in which practically all of the working element of the population are members, it would be possible to give maternity benefits for a period of from four to six weeks and in addition medical care and medicine at a cost varying from one-half to one and one-half per cent. of the wages. I believe that if a scheme of maternity insurance were developed in the United States it would be wiser to make it a general sickness insurance scheme rather than a specific maternity insurance.

TO WHAT EXTENT MAY THE MOTHER SUBSTITUTE PROPRIETARY PREPARATIONS FOR THE ADVICE OF A PHYSICIAN.

DR. CARL L. ALSBERG, Washington, D. C.: The question involved is one of vital interest to the mother, the physician, the welfare worker, the dealer, and state and federal officials. The health officer must be as fair in his acts as it is humanly possible to be. The mother in giving proprietary remedies is governed by false ideas of economy and convenience, and the truth should be presented to her by all possible means. The physician has a public and professional duty in the education of the public upon this vital question. The dealer is concerned solely from the business standpoint. The solution lies in an educated public opinion.

In the annual business meeting held on Thursday morning reports were received from affiliated societies. Through its affiliated membership the Association is in touch with baby-saving activities in 71 cities, representing 28 states, the District of Columbia, Canada and the Philippine Islands. The activities covered by these organizations include: Prenatal care and instruction of expectant mothers; infant-feeding conferences; milk stations; instruc-

tion of mothers in care of babies, well and sick; hospitals for babies; care of homeless babies; social service work in connection with hospital care of mothers and babies; visiting nursing, town and country; city and state departments of health.

DR. GAVIN S. FULTON, Louisville: In our babies' milk station we have done away with the rule of giving free milk to everybody and give it only to those in great need. This change has made no difference in attendance and the interest in the teaching side has not abated. In our obstetrical clinic which has been in operation for two years—we started out without money and are still without money—we have discontinued its connection with the University of Louisville and are running it solely from the standpoint of helping the child and leaving out the student side. We have five stations in which a weekly clinic is held with a doctor and nurse in attendance. We have had a death rate among the children seen in these clinics of 1.2%.

DR. J. H. MASON KNOX, Baltimore: We have been able to enlarge our work during the past year by the addition of four new welfare stations. We have a supervising nurse in the central office where the matter of publicity is looked after. The new features of our work have been possible by funds given us largely through an educational campaign carried on by the *Baltimore Sun*, and by an alliance of eight of our federated charities. We have in connection with the Johns Hopkins clinic a nurse visitation service and we are undertaking the visiting of all dispensary cases. We have access to the birth registrations of the city, and every week our nurse visits the homes of the newborn babies. In this way we shall be able to keep the newborn babies under skillful advice for the first year of their existence.

DR. THOMAS B. COOLEY, Detroit: An interesting new departure which we made in Detroit was to establish a health center in a manufacturing village on the edge of our city. We have had here a baby dispensary. In the first quarter the mortality for the village, as a whole, was reduced from approximately 27% to 17%, and in the district where intensive work was done, the mortality dropped from 25.8% to 12.6%.

MISS HELEN MACDONALD, Hamilton, Ontario: We have had an encouraging year. We have had requests for new stations and have opened two permanent ones with weekly clinics. We have only volunteer workers.

MISS CARR of Montreal: We have 23 French and five English stations, all supported by the city. We have people coming to them from almost every nation in the world.

DR. JOSEPH S. WALL, District of Columbia: We have had an increased attendance at our welfare stations from 76 in the first year to 1749 in the present year. We established the prenatal work two and a half years ago, and the total number of mothers reached is 244. We have added to our nursing staff a prenatal nurse and a field nurse. Every one of our mothers has had the ability to breast-feed her babies, and satisfactory results have been obtained by instituting the four-hour nursing schedule when the mothers were working away from home. We have an eight-hour law in our city, and this gives the baby one nursing, if the mother can go home or have the baby taken to her. We have three and four conferences a week in our milk stations. We try to make the stations as attractive as possible and look upon them as mothers' clubs.

DR. HENRY F. HELMHOLTZ, Chicago: I can report for Chicago an increase of from 5400 to over 8000 cared for at our milk stations. We have worked successfully in co-operation with the Illinois Home and Aid Society. A special nurse visits all the homes in which the Aid Society has placed its babies and sees that the foster mothers come to an infant welfare station once every two weeks.

DR. WILLIAM N. BRADLEY, Philadelphia: Among the newer activities of our baby welfare work is an investigation of the manner of control of homes for children under three years of age, and a plan has been worked out for their government. An effort has been made to have hospitals adopt certain regulations helpful to child welfare, in the matter of number and lengths of visits to children in the hospitals, the wearing of gowns by visitors entering the wards, in the answering of inquiries by some one in intimate charge of the patient with the least possible delay. One other activity has been the establishment of a wet nursing bureau under the control of the new department of child hygiene which has come about largely through the efforts of the Babies' Welfare Association.

DR. J. HERBERT YOUNG, Boston: The work of our baby welfare association has grown from 738 babies under our care in 1909, to 4679 for the year ending October, 1915. This means that approximately 25 per cent. of the entire infant population of Boston is now receiving milk and nursing at our twelve stations. Our medical staff has increased from 14 to 24 physicians. Almost without exception these men are specialists in the care of infants and children. Although we are still unable to pay our physicians, these appointments are highly esteemed.

MISS MARY ARNOLD, New York: Our Babies' Welfare Association is a federation of all organizations affecting babies directly or indirectly. Our Board of Health sends a letter to all mothers losing their babies, asking if they would like to nurse another. A nurse is sent to inspect the case, and if the conditions are satisfactory, the mother is sent another baby to nurse. The Association acts as a clearing house in the federation. We have now fifteen hospitals which report their babies to us on discharge. The nurse in the milk station waits to see whether the mother brings her baby to us, and if she does not, visits the home, so that in the first month of life the baby may receive the care it needs.

DR. COLLINS H. JOHNSTON, Grand Rapids: We got our inspiration from Cleveland, where we sent our first delegation four years ago. Our death rate has not been above 10% in the last five or six years. We have two outdoor clinics and shall have two more this fall. "I would rather have the nurse of the infant welfare than any doctor in this city with my baby," I hear almost every day. As one of the baby doctors of Grand Rapids, you can imagine the pleasure I take in hearing that. From all over Western Michigan people bring their babies to Grand Rapids, not to any individual but to our infant clinic.

DR. GEORGE W. COLER, Rochester: We are trying to link our baby welfare work with the schools, placing the emphasis chiefly upon education. We also have a day nursery for the care of children of women obliged to work away from home, and in one school we have 35 children under three years of age. We give them a decent meal, have provided a victrola and altogether they have an exceedingly satisfactory time in this station. Our aim is prenatal and postnatal work with the care of the child after it leaves

the milk station, so that it may not be thrown on a one- to five-year scrap heap. At five years, when entering the school, the school physician will follow it up until it goes to work. This, it seems to me, should be the real aim of welfare work.

Mrs. MAX WEST, Federal Children's Bureau, Washington, D. C.: We are preparing for a nationwide baby week next spring. We have prepared a circular of information which we are glad to furnish upon application. The Children's Bureau is especially anxious to deal with the rural problem.

THE VALUE OF NEGATIVE GENETICS.

PROFESSOR E. G. CONKLIN of Princeton University: The question has been proposed to me, "How the number of births of children receiving a faulty heritage from their parents may be reduced." Theoretically, it may be slightly reduced by segregation or sterilization of the parents; practically, this can be applied only to the most defective individuals who are usually under the care or duress of the state, and it would not greatly reduce the number of defective children. Many defective children are born of normal parents who still carry the taint in their blood; if such persons could be prevented from having offspring, a much larger reduction in the number of defective children would result. Finally, many defective children are born of apparently normal lines; in some cases these defects may be traced to adverse environment, in many cases their causes are wholly unknown. If the methods of animal and plant breeders could be rigidly applied to man, there is no doubt that a great improvement could be effected in the human race, but for many reasons these methods cannot be closely followed.

DISCUSSION.

MR. HOMER FOLKS, President: While in New York State we have a law looking toward the sterilization of the undeniably defective, it has not been urged by the social workers of the state and has remained a dead letter. It is the consensus of opinion among social workers in New York that the segregation of the mentally deficient should be brought about.

DR. CHARLOTTE ABBEY, Philadelphia: I am inclined to believe that the fact of 30 per cent. of normal parents bearing defective children is due to lack of responsibility and ignorance of the laws of nature. When our teaching emphasizes the fact that the act which brings a child into the world must be kept sacred, as Nature intended, children will be well born.

PROFESSOR CONKLIN, closing: Undoubtedly the best method for the prevention of reproduction by the seriously defective lies in one of the two methods suggested. Segregation would probably be less offensive to the public mind and more readily enforced than sterilization, and is in large measure being done. We cannot bring about the segregation of any but the dependent class and that can and ought to be done. Coming now to the positive side of eugenics, it is probable that much more can be done here than on the negative side. The rate of breeding among the seriously defective is not very high. On the other hand the great danger is that the good stock shall disappear; the good heredity lines are running out. A campaign of education is needed, emphasizing to every man and woman that they live not unto themselves; that their most im-

portant duty is to leave in the world wholesome, happy children who shall perpetuate their ideals. The saddest thing I know is to see these splendid families from which our great men came, disappearing. We hear the maxim, "As rare as a dead mule or a Quaker baby," and certainly the fine stocks are running out in many places. This can be prevented by a campaign of education. If we prevent the reproduction of the best and allow the reproduction of the worst the race is doomed.

THE PROBLEM OF PRENATAL LIFE AND INFLUENCES WHICH MAY FAVORABLY AFFECT THIS PERIOD OF THE CHILD'S GROWTH.

Mrs. MAX WEST, Federal Children's Bureau, Washington, D. C.: It has been abundantly demonstrated that the proper and adequate care of prospective mothers decidedly increases the probability that the babies of such mothers will be born healthy and normal. The problem is first one of education, for until a sufficient proportion of the "effective public" appreciates the importance to the race of the prenatal period, it will be needless to look for widespread work of this nature. An important function of the Association should be the reporting from time to time upon the most practical working methods of giving prenatal care and of popularizing the work. Medical care, though conspicuously important, can produce only a part of the desired result, since the social conditions surrounding women at this time very largely determine their welfare.

PREPARATION FOR MOTHERHOOD.

DR. FLORENCE R. RICHARDS, Medical Director of the William Penn High School for Girls, Philadelphia: If it be true that "The women hold the destiny of the nation," it behooves us to prepare our girls to be good wives, mothers and home makers. This knowledge comes by careful training, and but few parents give this training to their growing girls, either because of ignorance or of false modesty. Of necessity, therefore, it must be done in the higher schools by women physicians able to speak with authority. A broad course in eugenics for girls should include a study of the family and the home and their value to the state; home nursing; a consideration of adolescence, marriage, reproduction (from the biologic standpoint); care of the baby, the racial poisons, prostitution, etc. Girls receiving such a course of study realize more fully the sacredness and responsibility of marriage and their duty to the next generation.

DR. W. GREGORY, Philadelphia: We need the well trained biologist to give to girls and mothers the information outlined by Dr. Richards. We need to lay special stress upon the importance of the right attitude toward right. It is beautiful to watch the development of a flower, but we find that the attitude toward human life has been abnormal, and that that which is the highest and most beautiful of all, has been looked upon as something to be ashamed of. Mothers, as well as daughters, are capable of correct training in this respect, and with this training given to mothers, much will have been gained without waiting for the next generation.

PRESIDENT'S ADDRESS.

ARE BABIES WORTH SAVING? INFANT WELFARE WORK: ITS PURPOSES, OPPORTUNITIES AND AGENCIES.

MR. HOMER FOLKS, New York: It has seemed to me that the only contribution I might hope to make

to this session was an attempt to interpret some phases of our work to the general public. Being one of that general public, I may, perhaps, sense some of their difficulties more clearly than our professional members, considering the matter from the layman's point of view under (1) The underlying purposes of infant welfare work; (2) The largeness of opportunity; (3) Agencies upon which the chief reliance must be placed. Under the first heading we find the outstanding fact to be that the work is preventive rather than remedial. In a very few years the infant welfare movement has changed from the dealing with the few for curative purposes to dealing with the multitude for preventive purposes. From every point of view infant welfare must be regarded as raising the level at which the struggle for existence occurs, and not simply a concession to humanitarian instincts. From the point of view of the largeness of opportunity we find great encouragement from the history of recent years that infantile illness and mortality are preventable with relatively little effort and expense. Compared with other large public health movements the reduction of infant mortality is simplicity itself. The New York State Health Department states that there are about 300,000 deaths per annum in the United States among infants under one year of age, and that 150,000 of these are preventable. For this work, we know that elaborate institutions are not required. We need chiefly plenty of paper, printer's ink, and trained nurses. I am indebted to one of my associates for the suggestion that printer's ink, rightly and continuously applied, will save many babies. Baby saving is the bargain counter of philanthropy. Infant welfare work is the great opportunity of the moment to do something in which everybody must believe. Just how much we can do is uncertain, because of many factors, chief among which is the lack of vital statistics. Concerning the agencies for this work, we find that the bulk of effort is being done by private initiative, receiving in many cases some public aid, with the tendency toward the transference of the work to public responsibility. It seems to me that the job is clearly a public one. Public health generally is certainly a public function, and infant welfare is an integral part of the public health problem.

THE POSSIBLE REDUCTION OF MORTALITY AMONG SUB-NORMAL INSTITUTIONAL BABIES.

DR. S. JOSEPHINE BAKER, Director of the Bureau of Hygiene of the Department of Health of the City of New York: The paper is a combined experimental study of the Bureau of Child Hygiene of the Department of Health of New York, The Child Helping Department of the Russell Sage Foundation, and the New York Foundling Hospital. The high mortality of infants in so-called "foundling asylums" is well known. In properly supervised placing-out systems this mortality has been reduced. Available statistics of the relative value of institutional versus placing-out care have been generally founded upon a mass consideration of all infants in the institution and broadly selected groups of the better physical type of infants placed out. The present study is based upon the placing out of the physically poorest type of institutional infant. These have included the premature infants, severe cases of marasmus and other nutritional disorders. The selected group included only the type in which the institutional mortality has previously been approxi-

mately 100%. The results of this procedure have shown a mortality rate decreased to 52%. The experimental study covered a period of 16 months.

INSTITUTIONS AS FOSTER MOTHERS FOR INFANTS.

DR. ALFRED F. HESS, New York City: We are convinced that the sweeping denunciation of the institutional care of infants is not justified. If the administration is poor the babies will suffer whether in homes or in asylums, and there is nothing inherent in either system which leads to health or to disease. At present there is no established statistical basis of approach to the question as there is no approved method of calculating the death rate in an institution. This Association would perform a valuable service if it devised a method having the approval of experts. It would then become possible to carry out comparative investigations of this important subject in various large cities of the United States.

REPORT OF A STUDY OF SELECTED COMMUNITIES WHERE INFANT WELFARE NURSING IS DONE ON A SMALL SCALE, INCLUDING A SUGGESTIVE FORMAL PLAN IN WHICH THE VARIOUS FORMS OF PUBLIC HEALTH NURSING ARE REPRESENTED.

MISS BESSIE S. LELACHEUR, New York: No large city in the United States can consider itself up to date without a well-defined program of infant welfare work. There are also countless smaller communities whose needs are as great and infant mortality greater. The report considers the work in 215 small towns and villages where many are doing infant welfare work and general nursing. The general nurses eagerly ask for suggestions upon effective infant welfare work to be fitted into their daily duties and responsibilities. The committee, therefore, concludes that a suggestive and flexible program should be worked out for the general nurse in which the family's health rather than that of the individual becomes the responsibility of the nurse.

A COMMUNITY PROGRAM OF PUBLIC HEALTH NURSING AND SOCIAL SERVICE AS WORKED OUT IN FALL RIVER, MASS., AND IN DAYTON, OHIO.

MR. RICHARD P. BORDEN, Fall River: Social agencies should be co-ordinated so that each shall work in its special department and all work together. Health is fundamental in community efficiency. Hospitals are expensive, and it pays to avoid the necessity of hospital care. Therefore, visiting nurses are necessary adjuncts of hospitals. Sources of accident and disease are ignorance and improper methods of living. Settlement houses teach the family that it is cheaper to prevent disease than to cure it, and in consequence, hospital costs are reduced. Day nurseries, children's societies, and other social organizations are directly related to the hospital and its kindred agencies. While it is valuable to preserve entities of social organizations, business and benevolence should combine.

MISS ELIZABETH GORDON FOX, Washington, D. C.: Believing that the old plan of specialization in public health nursing was wasteful, confusing and inefficient, in 1914 the Visiting Nurse Association, the Tuberculosis Society, and the Department of

Health of the City of Dayton, Ohio, "pooled" their interests, and combined the three staffs of nurses into one, under one superintendent, in one headquarters. While each governing body retained its own autonomy and raised its own budget, the work of the three was administered as a unit. The nursing specialties were eliminated, the city was divided into small districts, one nurse to a district, and each nurse did all kinds of nursing in her own district. The infant welfare work was greatly increased in quantity and quality as a result of this plan of centralization and generalization. The infant mortality rate fell from 133 during the four summer months of 1913 to 85 during the same period of 1914. This was felt to be largely due to the efficiency of the new plan of administration.

DISCUSSION: SPECIAL VERSUS GENERAL NURSING IN
INFANT WELFARE WORK.

DR. H. J. GERSTENBERGER, of Cleveland: That which we most desire to accomplish is the adoption of a plan which will bring the best results to the individual and to the community. I have believed for many years that the best results in public health and social work are to be secured by placing all of the work of a district in the hands of one worker, who shall be supervised and directed by a physician who, upon the basis of knowledge and common sense, is competent to have such supervision and direction.

MISS MARIE PHELAN, Chicago: The infant welfare nurse must be interested in the family and in the sanitary conditions of the home that she may create a proper environment for the baby. It is through her influence that the father is referred to the tuberculosis clinic and the nurse is welcomed to give information concerning the conditions of the home. The question of more than one nurse coming into the home has been greatly over-estimated; in reality there is little fear of overlapping. In only two families in eighteen districts were the infant welfare nurse and the district nurse visiting at the same time. I think but few nurses are capable, mentally and physically, to look after every branch of nursing.

DR. S. JOSEPHINE BAKER, New York: I take issue absolutely with Mr. Borden that the function of the public health nurse is nursing the sick. Those of us who heard Mr. Folks' address could not but be impressed with the emphasis he placed upon the primary function of this Association being the prevention of infant mortality. Just in so far as we emphasize that note shall we be successful. The nurture of the well has its place in contradistinction to the nursing of the sick. If we are going to deal only with the sick baby, our ideas will be so diverted from the main purpose that our well baby is going to stand in the background. In our municipal work when we have tried to keep the well baby well, our mortality has dropped sharply. The public health nurse, from the point of view of the department of health, is a sanitary officer with the education of a nurse. She is a teacher, but she is not like the district nurse, a nurse of the sick. There is great danger of overspecialization, but not necessarily so if our ideals are kept clearly in mind.

Book Reviews.

The Medical Clinics of Chicago, Vol. I, No. 4, January, 1916. Philadelphia and London: W. B. Saunders Company.

The fourth number of the Medical Clinics has nine contributors. The subjects discussed include the Schick reaction, tic douloureux, malaria, cerebrospinal meningitis and infantile la grippe, among others. The discussion is usually presented in the form of an informal clinical lecture, based on a particular case. In other words, the Clinics represent a number of case reports, quite unrelated, with a certain amount of space devoted to the personal views of the contributors. The publishers promise that beginning with the March number, there will be contributions by Dr. Case on Roentgenological subjects.

A Treatise on the Principles and Practice of Medicine. By ARTHUR R. EDWARDS, M.D. Third edition, thoroughly revised and rewritten. Philadelphia and New York: Lea and Febiger. 1915.

Dr. Edwards is Professor of Medicine in the Northwestern University Medical School in Chicago. The plan of the third edition, like that of its predecessors, is along the conventional lines of medical text-books. The scope of the book covers the whole range of medicine, including diseases of the nervous system. It is, of course, impossible for one man to write with authority on all the subjects covered in this vast range. Dr. Edwards is unusually successful in avoiding errors. The book is well balanced, not only as a whole, but in the discussion of individual diseases. The discussion of treatment is particularly good in its brevity and soundness.

Principles and Practice of Physical Diagnosis. By JOHN C. DACOSTA, JR., M.D. Third edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1915.

The first edition of this book appeared in 1908. The third edition brings the work up to date by including recent advances, particularly in electro-cardiography and radiography. It is essentially a discussion of the technical methods for the detection of thoracic disease. In the book of 560 pages, less than 70 pages are devoted to abdominal diagnosis. The author confines himself strictly to physical diagnosis. Diagnosis by history and diagnosis by laboratory methods are not included.

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IMPORTANCE OF INFANT WELFARE.

THE week of May 8 to 13 was observed both in New York City and in Washington, D. C., as "baby week," and Sunday, May 14, as "mothers' day" throughout the United States. Numerous public meetings, clinics, and demonstrations were held during the week, and addresses were made by leading pediatricians and public health officials. In Washington an infant welfare exhibit was held under the direction of the local Twentieth Century Club. In New York the National Child Welfare Association gave a series of teas and lectures in its rooms. Whatever the ultimate value of such observances, they at least serve to direct public attention and interest toward some of the important problems of infant nurture, mortality, and welfare.

In this conjunction the present issue of the JOURNAL is published as a special pediatric number, analogous to the cancer number of

July 15, 1915, and the obstetric number of March 30, 1916. It contains a number of articles on pediatric topics by well-known members of the profession, and the reports of meetings of several pediatric societies. Among the latter especial attention is called to the report of the sixth annual meeting of the American Association for Study and Prevention of Infant Mortality, held last fall in Philadelphia, in conjunction with the Philadelphia County Medical Society. Boston members have taken a leading part in the work of this organization, and the report of its proceedings at this time, together with those of the New York and New England Pediatric Societies, is particularly appropriate in this issue, devoted to the consideration of certain medical topics of importance in infant welfare.

THE PREVENTION OF VULVO-VAGINITIS.

IN this issue of the JOURNAL are published two papers dealing with the management of diseases due to the gonococcus. The prevention of these diseases is a vast proposition, the handling of which the world must some time seriously attempt. Steps are being taken now and then to separate pieces of this problem from the main issue and to handle them one by one. The prevention of the spread of vulvo-vaginitis is one of these. Two years ago the American Pediatric Society appointed a committee to consider the question of the occurrence and prevention of this disease. This committee reported to the Society at the recent meeting in Washington. The report, as finally adopted, is as follows:

1. That the American Pediatric Society address a special letter to health officers, containing the following recommendations:

A. That cities be required to provide adequate hospital and dispensary facilities for the care and treatment of children having vaginitis.

B. That matrons be placed in charge of the girls' toilet rooms in public schools.

C. That toilet seats embodying the principle of the U-shape be used in all schools and that the toilets be of proper height for different ages.

D. That city and state laboratories be empowered and equipped to make bacteriological examinations for physicians when patients cannot afford to pay a private laboratory fee.

E. That educational literature on the subject of vaginitis be prepared and distributed to mothers through the medium of physicians, hos-

pitals, dispensaries, health centers, municipal and visiting nurses.

F. That asylums for children and day nurseries be licensed, and that the license be not granted unless: first, the institution has adequate facilities for the recognition of gonococcus vaginitis; and second, the institution excludes children having this disease if they cannot be properly isolated.

2. That the American Pediatric Society address a special letter to hospitals which care for children, containing the following recommendations:

A. That separate wards be maintained for the treatment of children with vaginitis who are also suffering from other diseases.

B. That microscopic examination of smears be made before admission to the general wards of the hospital. In securing material for the smears extreme care should be taken to observe rigid aseptic precautions.

C. That observation wards be provided.

D. That individual syringes, bed-pans, catheters, clinical thermometers, thermometer lubricant, wash basin, soap, powder, wash cloths and towels be provided.

E. That single service diapers be used (at least for girls); or, that diapers be sterilized in an autoclave at 15 pounds pressure for five minutes.

F. That nurses be required to make daily inspection of the vulva of each girl at the time of bathing and to report immediately the presence of the slightest suggestion of a vaginal discharge.

G. That low toilets be provided and equipped with seats embodying the principle of the U-shape.

H. That for routine purposes, the spray be used in place of tub baths for the bathing of young girls, and that older girls be sponged in bed.

I. That nurses receive special instruction as to the nature of vaginitis, the ease with which it is transmitted, the methods of preventing its spread and the necessity for rigid aseptic surgical technic in its handling and treatment.

J. That a dispensary with special facilities for the treatment of gonococcus vaginitis be provided.

K. That nursing care and supervision be given in the home.

L. That mothers be instructed as to the dangers of vaginitis, the manner in which it is transmitted, the best method of protecting other children, and the necessity of prolonged observation.

M. That all cases of vaginitis under observation be voluntarily reported to the local health officer in states or cities where no legal requirements are in force.

The question whether children known to have gonococcus vulvo-vaginitis should be quaran-

tinued brought forth varying opinions. Those in favor of their exclusion held the belief that schools were important factors in the spread of the disease, and that healthy children should not be exposed to the danger of infection. Those opposed to exclusion argued that with proper toilets (the U-shaped seat), and proper supervision of children during recess, the chances of contagion were less than if infectious children were kept in school and allowed to play unwatched. Idleness throws many a temptation before one, and especially in the case of children already aroused sexually, as no doubt a considerable number of girls with vulvo-vaginitis are, the long hours with nothing to do are full of danger for smaller brothers and sisters and for other children after school. The welfare of these girls themselves must be considered. If innocently infected, why should they be deprived of education for the period during which they are under treatment. If infected through improper practices, all the more reason why they should come under the influence of teacher and school nurse, and, while still in the plastic age, be diverted from the sort of life towards which they are started. That the disease is not rare is shown by the figures from the out-patient department of the Massachusetts General Hospital, where during 1915, 64 cases were treated, and in the first four months of 1916, 33 new cases were admitted. These are all foci from which the disease may be spread, and in the prevention of its dissemination there is need for the highest kind of coöperation between the medical attendant, the mother and the school or visiting nurse.

The infection of little girls in hospital wards is a disgrace to modern medicine. It is preventable; the recommendations of the American Pediatric Society point the way. Let us see to it that another two years show that this excellent advice has been followed.

EXAMINATION OF SCHOOL CHILDREN IN BOSTON.

ATTENTION is called to the report on page 744 of this issue of the JOURNAL by the Director of Medical Inspection in Boston schools. Of a total of 49,777 pupils examined, 14,985 were found to be without defects. Taking into consideration the fact that hypertrophied tonsils

(in 9,812), defective teeth (in 28,101), and skin diseases (in 1,938) were, of course, counted as defects, these figures are not so discouraging as they at first appear.

The discovery of serious disease, such as tuberculosis (pulmonary in 24 cases, of bones and joints in 49 cases) and organic cardiac disease (in 725 cases) proves the value of the examination of school children. The discovery of serious disease, important as it is, must not blind us to the significance of the finding of the less serious defects, such as nasal deformities, poor teeth, faulty posture and malnutrition. After all, the majority of children with organic cardiac lesions will always be handicapped, and all the medical care in the world cannot bring them up to the average physical standard. The same amount of medical care applied in good season to those with the minor defects will give better returns, inasmuch as children suffering only from the latter may be made practically perfect, as far as physical efficiency is concerned.

It is discouraging to note that 243 mentally deficient have been found, to add to the 15,000 already listed in Massachusetts.

MEDICAL NOTES.

INFANT MORTALITY IN NEW YORK CITY.—Infant mortality studies made in connection with Baby Week by Registrar Guilfooy of the New York City Department of Health indicate that deaths from congenital defects are more prevalent among babies of the rich than among the babies of the poor. This is all the more remarkable since the infant death rate as a whole is much lower among the wealthy classes. According to Guilfooy, the chances of New York City's babies vary according to location, as follows:

On Central Park West 25 babies out of every 1000 born die in the first year.

In the Dyckman section of Manhattan, 50 babies out of every 1000 born die in the first year.

On the Lower East Side 73 babies out of every 1000 born die in the first year.

In San Juan Hill (West 60th Street) 314 babies out of every 1000 born die in the first year.

The infant mortality rate for the entire City of New York, based on the 141,256 births reported during the year, was 98 per one thousand, that is to say, 98 children died out of every one thousand born during the year, approximately one in ten. This rate compares

very favorably with that of the large cities of the world:

The rates for 1915 in some of the large American cities were as follows, per 1,000 babies born: Baltimore, 120; Boston, 104; Buffalo, 108; Chicago, 114; Cleveland, 110; Denver, 131; Detroit, 104; Louisville, 113; New Orleans, 120; Philadelphia, 105; Pittsburgh, 110; Washington, D.C., 110.

EUROPEAN WAR NOTES.

NEED FOR RED CROSS AMBULANCES IN FRANCE. The national headquarters of the American Red Cross at Washington, D. C., has recently received from Mr. H. H. Harjes, president of the American Relief Clearing House in France, a letter stating, in part as follows, the great need for more Red Cross ambulances in that country:

"The original American Red Cross unit is doing good and satisfactory work in every respect. It has transported to date about 16,000 wounded. All the men are devoted and full of energy, and the service they are rendering is much appreciated. Some weeks ago the General Headquarters expressed the desire that all American units, and, in fact, all Americans working with the army in connection with the transport of wounded, should come in under the American Red Cross, and asked me if I would take up the matter with you, their object being to centralize all the good work being done through one responsible channel, and in order to establish a thorough and proper control. Hence my various cables to the Red Cross. It was a great satisfaction to the General Headquarters when you gave your consent to this being done.

"A unit known as the American Volunteer Motor Ambulance Corps, having Richard Norton at its head, has now come under the American Red Cross. His section was, up to quite recently, under the British Red Cross, and has been doing excellent work. I have also lately organized a ski section for the transport of wounded on ski sleighs. This section is operating in the Vosges, and is doing good and valuable work. All the volunteer American work in the field has been splendidly done and is extremely appreciated by every one. Unfortunately, there is no doubt that there is need for more help, particularly in the line of transportation for the wounded.

"I am most desirous of bringing about the creation of two new regular sections of twenty-two cars, these to be attached to a division in the field. Experience has shown that, with the exception of certain localities where the light car may be more handy to get over bad roads, the best equipment of a section is a uniform make of strong, big, high-powered cars, allowing for a large ambulance body for five or six men lying down, and as many as fifteen to twenty sitting, with plenty of power to do

quick evacuation work when fully loaded, these cars to be intermixed possibly with half a dozen lighter cars to cope with special conditions.

"Do you think it would be possible to get donated, say, forty-four chassis, of which, say, thirty-two are high-powered big cars and twelve light cars, and to get sufficient funds for the building here of forty-four ambulance tops at a cost of 1,000 f. each, the cars to have as drivers American volunteers and to be put under the American Red Cross? If this could be accomplished it would be a very great and needed help and would reflect further credit on the already wonderful work of the American Red Cross in France. The uniforming and the necessary fund for the upkeep of the personnel, it seems to me, could possibly be found here, and consequently the only donation desired from America is for the chassis and the ambulance tops."

The American Red Cross, as a result of Mr. Harjes's appeal, announces its willingness to receive the donations for the purpose stated.

EFFICACY OF ANTITYPHOID INOCULATION.—At the annual congress of German army surgeons at Warsaw, recorded in a recent issue of the JOURNAL, report was made by Surgeon-General Hühnermann of the gratifying efficacy of antityphoid inoculation in the German Army. Many million persons have been thus inoculated in Germany, with few injurious effects and no deaths. There has also been a practical disappearance of typhoid fever. During the month of December, 1914, for instance, there were in all Germany only one-fourteenth the number of cases there were during the corresponding period of 1870.

RED CROSS SUPPLIES FOR GERMANY.—In response to recent American protests against the British embargo on medical supplies from the United States to the Teutonic Powers, a report from London on May 12 makes the following statement:

"The position of the British Government in this matter is quite clear. They are prepared to allow the dispatch of medical supplies to any American Red Cross units which may be working for the Central Powers, upon receipt of assurances as to their employment. They are not, however, prepared to allow medical supplies to be generally imported by the enemy.

"If the enemy suffer a shortage of certain commodities for medical purposes owing to the demands of the military services, their remedy, if they wish to safeguard the interests of their wounded, is obviously first of all to allocate a sufficient amount of available supplies for these purposes."

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending May 20, 1916, there were 227 deaths reported, with a rate of 15.57 per 1,000 population, as compared with 234 and a

rate of 16.30 for the corresponding week of last year. There were 33 deaths under 1 year, as compared with 39 last year, and 62 deaths over 60 years of age, against 78 last year.

During the week the number of principal reportable diseases were: Diphtheria, 32; scarlet fever, 34; measles, 227; typhoid fever, 3; whooping cough, 31; pulmonary tuberculosis, 51.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 6, and tuberculosis, 5.

Total deaths from these diseases were: Diphtheria, 4; measles, 5; scarlet fever, 3; whooping cough 1; pulmonary tuberculosis, 23.

Included in the above were the following deaths of non-residents: Diphtheria, 1; scarlet fever, 2; measles, 1.

THIRD HARVARD UNIT.—On May 20 another group of surgeons and nurses, under the auspices of Harvard University, sailed for Europe on the *Andania* for service in the 22d General Hospital of the British Expeditionary Force in France. Though it goes by the name of the "Third Unit," it is merely continuing the work begun by the so-called "First Unit," which sailed last June under Dr. E. H. Nichols, '85, and of the "Second Unit," first under Dr. David Cheever, '97, and now in charge of Dr. W. E. Faulkner, '87. When the "First Unit" sailed it was expected that Units from two other American universities would follow it and go on with its work. This, however, proved impracticable, and Harvard undertook to keep the 22d General Hospital supplied until the end of the war.

The chief surgeon of the new Unit is Dr. Hugh Cabot, '94, assistant professor of genito-urinary surgery at the Harvard Medical School, and chief of his department at the Massachusetts General Hospital. The surgeons accompanying him are, with four exceptions, holders of Harvard degrees in medicine or dentistry. Dr. George C. Shattuck, '01, was a member of Dr. Strong's force in Serbia. Dr. Allen Greenwood, M.D., '89, was attached to the First Harvard Unit. Herbert H. White, '93, who has served as business manager of both the First and the Second Unit, will accompany the Third in the same capacity. Thirty-three nurses are enrolled with the Unit.

The roster of surgeons is as follows:

Dr. Hugh Cabot, M.D., surgeon-in-chief; Frederick J. Caldwell, D.M.D., Edward S. Dillon, 4M.; Thomas A. Foster, M.D.; Allen Greenwood, M.D.; Paul Gustafson, 4M.; John W. Hammond, Jr., M.D.; Lyman S. Hapgood, M.D.; Edward Harding; Carleton Ray Metcalf, M.D.; George B. Packard, Jr., M.D.; Harrison L. Parker, D.M.D.; Charles W. Peabody, 4M.; Wayne S. Ramsey, M.D.; Carl Merrill Robinson, M.D.; George Maurice Sheahan, M.D.; George C. Shattuck, M.D.; Harold W. Stevens, M.D.; Henry R. Viets, Jr., 4M.; H. H.

White; and Drs. Dennis R. W. Crile, Norman M. Keith, Ralph C. Matson, Robert S. Stevens.

Of this group Dr. Hammond has already sailed for Europe, to relieve Dr. Francis R. Fraser of the Second Unit, who is going to the front.

Massachusetts Medical Society.

NOMINATING COMMITTEE FOR 1916-1917.—

The following is the nominating committee elected by the eighteen District Medical Societies at their annual meetings during April and May, 1916. Their duty is to nominate officers and orator at the annual meeting of the Council, June 6.

District	Principal	Alternate
BARNSTABLE	E. E. HAWES	C. W. MILLIKEN
BERKSHIRE	J. H. RILEY	E. W. MARKHAM
BRISTOL NORTH	F. A. HUBBARD	R. D. DEAN
BRISTOL SOUTH	A. H. MANDELL	R. W. JACKSON
ESSEX NORTH	F. W. SNOW	R. V. BARETEL
ESSEX SOUTH	G. M. KLINE	BUTLER METZGER
FRANKLIN	G. P. TWITCHELL	
HAMPDEN	J. M. BINNIE	H. W. VANALLEN
HAMPSHIRE	O. W. COBB	J. S. HITCHCOCK
MIDDLESEX EAST	E. C. FISH	
MIDDLESEX NORTH	J. J. MCCARTY	J. H. LAMBERT
MIDDLESEX SOUTH	E. H. STEVENS	C. T. WARNER
NORFOLK	T. J. MURPHY	A. N. BROUGHSTON
NORFOLK SOUTH	J. C. FRASER	C. S. ADAMS
PLYMOUTH	A. E. PAINE	F. G. WHEATLEY
SUFFOLK	G. W. W. BREWSTER	A. L. CHUTE
WORCESTER	DAVID HARROWER	J. T. DUGGAN
WORCESTER NORTH	A. P. MASON	E. L. FISKE

WORCESTER DISTRICT MEDICAL SOCIETY.—The Annual Meeting of the Society was held at Hotel Bancroft, Worcester, at 4.30 p.m., May 10, 1916, at which the following officers were elected for 1916-17:

PRESIDENT.

Dr. Geo. O. Ward, Worcester.

VICE-PRESIDENT.

Dr. Michael F. Fallon, Worcester.

SECRETARY.

Dr. E. L. Hunt, Worcester.

TREASURER.

Dr. Geo. O. Ward, Worcester.

ORATOR.

Dr. Wm. L. Johnson, Uxbridge.

COMMITTEE ON FUNDS.

Dr. O. H. Everett, Worcester.....term began 1898
Dr. Homer Gage, Worcester..... " " 1911
Dr. David Harrower, Worcester..... " " 1916

COMMISSIONER OF TRIALS.

Dr. Ray W. Greene, Worcester..... " " 1916

COUNCILLOBS.

Dr. W. P. Bowers, Clinton.....term began 1902
Dr. F. H. Baker, Worcester..... " " 1914
Dr. Frank H. Clapp, N. Grafton..... " " 1916
Dr. Wm. J. Delahanty, Worcester..... " " 1913
Dr. John T. Duggan, Worcester..... " " 1904
Dr. Michael F. Fallon, Worcester..... " " 1916
Dr. Homer Gage, Worcester..... " " 1906
Dr. J. O. Genereux, Webster..... " " 1916
Dr. David Harrower, Worcester..... " " 1905
Dr. Albert G. Hurd, Millbury..... " " 1916
Dr. W. L. Johnson, Uxbridge..... " " 1914
Dr. Frank H. Washburn, Holden..... " " 1916

Dr. S. B. Woodward, Worcester.....term began 1912
Dr. C. D. Wheeler, Worcester..... " " 1914

COUNCILOR ON NOMINATIONS.

Dr. David Harrower.....term began 1913
Dr. J. T. Duggan, Alternate..... " " 1916

CENSORS.

Dr. Frank H. Washburn, Holden,
Supervisor term began 1912
Dr. Geo. E. Emery, Worcester..... " " 1914
Dr. C. B. Stevens, Worcester..... " " 1915
Dr. Wm. E. Denning, Worcester..... " " 1916
Dr. D. F. O'Connor, Worcester..... " " 1916

AUDITING COMMITTEE.

Dr. J. Arthur Barnes, Worcester.....term began 1916
Dr. Mary Barrell, Worcester..... " " 1916
Dr. Gilbert Haigh, Worcester..... " " 1916

LIBRARIAN.

Dr. Geo. C. Lincoln, Worcester.....term began 1915

LIBRARY COMMITTEE.

Dr. T. J. Foley, Worcester.....term began 1912
Dr. Benj. T. Burley, Worcester..... " " 1916
Dr. Myrtle Smith, Worcester..... " " 1916

NOMINATING COMMITTEE.

Dr. Geo. A. Dix, Worcester,

Chairman, term began 1915

Dr. G. E. Adams, Worcester..... " " 1915
Dr. James R. Kirby, Clinton..... " " 1916
Dr. John T. Cahill, Worcester..... " " 1916
Dr. Alexander McNeish, Leicester... " " 1916

HAMPSHIRE DISTRICT MEDICAL SOCIETY.—

Through the courtesy of Dr. J. A. Houston, the Hampshire District Medical Society was entertained at dinner and held its annual meeting at the Northampton State Hospital on May 11, 1916.

The members were taken on a tour of inspection of the hospital.

Presidential address on insanity was read by Dr. O. W. Cobb.

Dr. Houston gave some general remarks concerning the Hospital and Insanity.

The members of the staff gave the following papers:

The Relations of Alcohol to Insanity, Dr. E. C. Green.

The Relations of Syphilis to Insanity, Dr. A. N. Ball.

The Relations of Pellagra to Insanity—Dr. B. A. Bober.

A Demonstration of the Binet and Yerkes Tests, Dr. B. A. Bober.

NORFOLK DISTRICT MEDICAL SOCIETY.—At the annual meeting of the Norfolk District Medical Society, held at the American House, Boston, May 9, Dr. Thomas F. Greene, of Roxbury, was elected president for the ensuing year. Following the dinner, which was attended by 151 members, the custom of recent years of having a theatrical performance by members of the society was carried out by giving a play entitled, *The Way of the Woman* (Suffragette) and a farce called *Fun in a Turkish Bath*. These were written and managed by Dr. A. P. Perry, of Jamaica Plain. *The Way of the Woman* was a clever travesty on the methods of management of a woman's hospital and the leading rôles were

taken by five women members of the society, who displayed considerable histrionic ability. The farce showed that the society has some vaudeville artists of a high order of merit.

Miscellany.

REPORTS ON PHYSICAL EXAMINATIONS OF PUPILS OF BOSTON PUBLIC SCHOOLS FROM DECEMBER 1, 1915, to APRIL 1, 1916.

BY WILLIAM H. DEVINE, M.D.,

Director of Medical Inspection.

Total number of pupils examined	49,777
Total number of pupils without defects ..	14,985
Total number of pupils with defects	34,792
Defective Nasal Breathing,	
Anterior	555
Posterior	3,462
Hypertrophied tonsils	9,812
Defective teeth,	
Primary	16,953
Secondary	11,148
Defective palate	215
Cervical glands	9,109
Pulmonary disease,	
Tuberculous	24
Non-tuberculous	456
Cardiac disease,	
Organic	725
Functional	888
Nervous disease,	
Organic	38
Functional	123
Chorea	18
Orthopedic defects,	
Tuberculous	49
Non-tuberculous	877
Skin	1,938
Rickets	276
Malnutrition	1,222
Mental deficiency	243
Total number of defects	58,131

Medical inspection under the supervision of the School Board was not organized until November 22, 1915. The first ten weeks of school, an important time for medical inspection, were thus lost. Consequently, statistics will not be completed until the end of the school year, when they will then be available for comparison with statistics of previous years.

The present is opportune to give results of the examinations to the profession, more especially to the family physician, to whom most of these cases have been referred.

There is no marked variance with results of 1913-1914 (1914-1915 not available) with the

exception of pulmonary tuberculosis. In 49,777 pupils examined from December 1, 1915, to April 1, 1916, 24 cases of pulmonary tuberculosis were found. For a corresponding number in 1913-1914, 58 cases, or more than twice as many, were discovered.

Credit for this encouraging condition is due to medical inspection of schools with its years of advocacy of open-air classes, etc., and to other agencies, such as the Association for the Relief and Control of Tuberculosis and the Health Department. The present administration, in existence but a short time, is not claiming any credit for this situation.

The large number of cardiac cases is appalling. Naturally, the number would remain about the same, or increase from year to year, as children are not excluded from school for this disease. The prevention of heart disease offers a great field in prophylactic medicine. It has been stated that, in many cases, parents receive their first intimation of the existence of heart trouble in their children from the school physician. No doubt, in the future, the physician will be urged to examine the heart more carefully during convalescence, to detect impairment. Whether prophylaxis will give the same results in this as in other diseases, remains to be seen.

Defective teeth is a serious problem. In 49,777 children 16,953 had defective primary and 11,148 defective secondary teeth. These figures remain practically the same as in previous years.

The pupils of the Rice and Christopher Gibson Districts were examined by dentists, with the result that in the former 7% and in the latter 10%, were found with normal teeth. The school physicians found between 35% and 40% normal.

This discrepancy is not as great as would appear, for the reason that expert dentists would discover minute defects not recognized as such by the school physicians. Experts claim that dental prophylaxis applied in the kindergarten and first grades would practically eradicate defective teeth.

School physicians, nurses and teachers will urge parents to properly care for teeth at this stage.

Future statistics may show the wisdom of this course.

The Forsyth Dental Infirmary will be of incalculable assistance in the furtherance of this work.

Physicians and nurses will follow up cases as soon as physical examinations are completed, in order to ascertain if the parents or guardians have taken action to correct defects.

Statistics are uninteresting to the majority. Occasionally they are startling and sensational. They accomplish much, at times, by attracting the attention of the community to unwholesome conditions. They are valuable inasmuch as they are the gauge that registers corrections.

The Boston Medical and Surgical Journal

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Therapeutic and Preventive Medicine.

FIVE YEARS' PROGRESS IN THE DIAGNOSIS AND TREATMENT OF CONSUMPTION BY MASSACHUSETTS PHYSICIANS.*

By JOHN B. HAWES, 2d, M.D., BOSTON.

FIVE years ago, in a paper read before the Suffolk District Medical Society,¹ I presented certain facts and figures, based on a study of 500 patients then in our State sanatoria and 300 cases from two large Boston out-patient departments, in regard to the early diagnosis and prompt treatment of pulmonary tuberculosis in this State. The conclusions I was forced to draw from this study were not encouraging, nor did they reflect creditably on the ability of our medical profession to diagnose tuberculosis in its early stages or its willingness to institute prompt and aggressive treatment. For instance, out of the 500 patients then in our sanatoria, well over 50% were told by the first doctor they consulted that they did not have consumption, while of those who first went to a doctor on account of a hemorrhage, nearly half were informed that the blood did not come from their lungs, and that they did not have tuberculosis.

I did not believe at the time that this could be anything but a temporary state of affairs, and I

* Read before the Worcester County Medical Society, Feb. 9, 1916.

¹ The Responsibility of the Medical Profession for the Early Diagnosis and Prompt Treatment of Pulmonary Tuberculosis. Reprinted from the BOSTON MED. AND SURG. JOURN., Feb. 8, 1912.

was firmly convinced that the vigorous campaign which was then, and still is, being carried on to educate both the public and the medical profession in matters of general health and the prevention of disease, must soon begin to show good results. A sign of this progress is shown by the fact that the percentage of incipient cases at the Rutland State Sanatorium, which fell as low as 18% in 1910, when the applications of patients for this institution were first thrown open to the medical profession, has now risen to 37% for the year 1915. This increase in the proportion of incipient cases at Rutland is in spite of the fact that the provision for consumptives in Massachusetts at the present time is not relatively greater than was the case in 1911. In other words, while the actual number of beds has decidedly increased, there has also been an equal increase in the number of cases discovered and diagnosed. It is all the more encouraging, therefore, to note distinct signs of progress in the early diagnosis and treatment of tuberculosis by Massachusetts physicians during the past few years. Probably the great factor in the improvement which has been made is the growing realization by the medical profession of the seriousness of the problem and that, to make headway in the campaign, coöperation of all forces is necessary. The establishment of tuberculosis dispensaries in cities and towns of 10,000 inhabitants or over, which has at last been accomplished, will be a tremendous help. The fact that a tuberculosis nurse has been regarded as an essential part of such a dispensary is of still greater help.

The facts and figures which I am about to pre-

sent show a marked improvement over the similar ones of four years ago. They are based on a study of 100 consecutive cases diagnosed as tuberculosis at the Massachusetts General Hospital, 100 at the Boston Consumptives' Hospital, and a further study of 500 patients at the North Reading, Lakeville, Westfield, and Rutland State Sanatoria. From the records of patients at the Massachusetts General Hospital and Boston Consumptives' Hospital I hoped to find out first how long it took to make a diagnosis of consumption,—the prompt diagnosis,—and second, its early diagnosis.

TABLE I.

OUT-PATIENT DEPARTMENT, MASSACHUSETTS GENERAL HOSPITAL.

One Hundred Cases of Pulmonary Tuberculosis.

DIAGNOSED AS TUBERCULOSIS.				STAGE OF DISEASE.			SPUTUM.		
Year.	At Once.	Within One Week.	More Than One Week.	I.	II.	III.	Positive	Negative.	Not Examined.
1911	70	15	5	30	51	19	58	18	24
1915	56	30	14	40*	47	13	19	17	64

* Positive sputum in only three cases.

The 1915 figures show an interesting change over those of 1911, in that, whereas in 1911, the number of first-stage cases (30) is not much less than that of 1915 (40); the number of positive sputa (58 in 1911) is notably greater than that of 1915, which is only 19. This means that the diagnoses are being made when the disease is really in its incipency, and not when it is already moderately advanced, with a positive sputum.

TABLE II.

OUT-PATIENT DEPARTMENT, BOSTON CONSUMPTIVES HOSPITAL.

One Hundred Cases of Pulmonary Tuberculosis.

DIAGNOSED AS TUBERCULOSIS.				STAGE OF DISEASE.			SPUTUM.		
Year.	At Once.	Within One Week.	More Than One Week.	I.	II.	III.	Positive	Negative.	Not Examined.
1910	91	2	7	27	47	26	44	31	25
1915	92	5	3	14*	43	43	19	17	64

* No positive sputum in this group.

This table shows the same variance of the later figures over the earlier ones as in the preceding table. The number of positive sputa dropped from 44 in 1910 to 19 in 1915, showing again that the physicians in this hospital were able to make a positive diagnosis without the aid of a positive sputum examination.

In the second part of the study I have tried to find out what progress has been made by the profession at large in the prompt diagnosis, the early diagnosis, and last, the proper disposal of its consumptive patients. As in my earlier report, I had to obtain my information from patients themselves, using for the purpose 500 in-

mates of our State sanatoria. Cards asking certain definite questions, were given to the patients by the superintendents. The questions I asked this year were approximately similar to those asked four years ago, so the answers offer a just basis for comparison. A summary and analysis of my replies, compared with those of 1910, is here given:

TABLE III.

TABLE SHOWING NUMBER OF PATIENTS WHO NEVER SUSPECTED THAT THEY HAD LUNG TROUBLE UNTIL SO TOLD BY A PHYSICIAN.

Year.	N. R.	L.	W.	R.	Total.
1911	15	7	4	51	77
1915	85	79	71	173	408

I am really at a loss to explain the great difference between the earlier and the later sets of figures. I hope it means, first, that more patients are going to a doctor for routine examinations before they feel seriously ill; and, second, that doctors are more awake to the possibility of tuberculosis being present, even in the absence of signs pointing to this disease.

TABLE IV.

TABLE SHOWING CHIEF SYMPTOMS FOR WHICH PATIENTS CONSULTED THEIR PHYSICIANS.

N. R.		L.		W.		R.		Total.		
1911.	1915.	1911.	1915.	1911.	1915.	1911.	1915.	1911.	1915.	
55	54	46	58	53	57	106	90	260	250	Cough, Cold, Grippe.
24	20	23	20	20	27	58	48	125	115	Weak, Tired, Run down.
15	11	13	13	12	15	8	28	48	67	Pain in chest.
8	11	14	6	16	14	43	34	81	65	Hemorrhage.

This table needs no comment. The closeness of the figures, though four years apart, shows that the four great groups into which the symptoms of tuberculosis divide themselves, remain still the same. The comparative figures concerning "hemorrhage" are of decided interest, as shown by the following table:

TABLE V.

TABLE SHOWING NUMBER OF CASES IN WHICH PATIENTS CONSULTED A PHYSICIAN ON ACCOUNT OF HEMORRHAGE, AND THE PHYSICIANS' ANSWER AS TO WHETHER OR NOT IT MEANT TUBERCULOSIS.

N. R.	L.	W.	R.	Total.	
1911.	1915.	1911.	1915.	1911.	1915.
5	11	14	6	16	14
43	34	81	65	Total cases of hemorrhage.	
4	8	3	10	9	20
19	42	39	No. told that they <i>had</i> consumption.		
5	3	6	3	6	5
23	15	39	26	No. told they <i>did not</i> have consumption.	

The improvement shown in the 1915 figures over those of 1911 is not striking, but, nevertheless, very evident. In 1911 nearly 50% of those

patients who consulted a doctor on account of hemorrhage were told that this did not mean consumption and that they might go on their way rejoicing; in 1915 only 40% of this class of patients were thus misled. There is still room for improvement in this regard. The following figures are of equal interest:

TABLE VI.

TABLE SHOWING NUMBER OF PATIENTS SAID TO HAVE CONSUMPTION AND THOSE SAID NOT TO HAVE CONSUMPTION.

N.	R.	L.	W.	R.	Total.	
1911.	1915.	1911.	1915.	1911.	1915.	
33	60	42	49	40	48	100 92 215 249
67	40	58	51	60	52	100 108 285 251

Patients told that they DID HAVE consumption.

Patients told that they DID NOT HAVE consumption.

According to the 1911 figures out of 500 known consumptives 285, or 55%, were told by their doctors that they did not have consumption, or what is perhaps worse, were not told that they did have consumption. In 1915, the figures had dropped to 251, or a trifle over 50%. Here again there is still room for improvement.

What the patients were told by their doctors, or what they at least understood their doctors to say when they went away secure in the faith that they did not have consumption, is shown as follows:

TABLE VII.

TABLE SHOWING DIAGNOSES GIVEN PATIENTS BY THEIR PHYSICIANS WHO SAID THEY DID NOT HAVE CONSUMPTION.

N.	R.	L.	W.	R.	Total.	
1911.	1915.	1911.	1915.	1911.	1915.	
10	15	21	17	22	21	20 37 73 90
18	10	7	13	11	18	22 21 58 62
22	4	10	6	11	5	5 15 48 40

Bronchial trouble, bronchitis, cold, grip.

Run down, needed a rest.

Spot on lungs, weak lungs, lung trouble, lungs affected.

This shows at a glance the need of speaking, not unkindly or cruelly but clearly and distinctly, when a physician is endeavoring to explain to a patient the exact situation in regard to his lungs. Patients in such circumstances are looking out for every tiny detail which will strengthen their view that their lungs are sound; they will believe what they wish to believe. Within the past week a patient whom I sent to Saranac Lake, an extremely well-educated and intelligent young man, has returned with the idea, to use his own words, that "there is nothing much the matter with me," and is convinced

that the doctor told him so, and yet nothing could possibly be farther from the truth.

Despite making all allowance for the stupidity of patients or their wilful misunderstanding or misstatement of the facts, this showing is not a good one. It certainly seems as if out of 500 consumptives that over 50% should have been made to understand distinctly what was the matter with them.

The next table shows how prompt the physicians, or in some cases the patients, were in making application for admission to a state sanatorium after the diagnosis was made.

TABLE VIII.

TABLE SHOWING INTERVAL BETWEEN FIRST VISIT TO DOCTOR AND TIME OF APPLYING FOR ADMISSION TO A SANATORIUM.

N.	R.	L.	W.	R.	Total.	
1911.	1915.	1911.	1915.	1911.	1915.	
19	38	25	45	21	39	52 121 117 243
13	17	18	19	14	16	43 29 88 81
22	27	15	29	24	30	60 34 121 120
27	16	28	7	41	13	39 12 145 48

Applied within one week.

One week to one month.

One month to six months.

Waited over six months.

These figures of 1915 show a most encouraging improvement over those of 1911. Out of the 500 patients, over twice as many in 1915 made application at once for admission to a sanatorium and only one-third as many waited over six months before applying.

The number of physicians whom these 500 patients consulted in 1915 in order to obtain a diagnosis and treatment was approximately the same as in 1911, the earlier figures being 1128, the latter, 1157. This is shown in the following table:

TABLE IX.

TABLE SHOWING TOTAL NUMBER OF DOCTORS VISITED BY FIVE HUNDRED PATIENTS.

Year.	N.	R.	L.	W.	R.	Total.
1911	202	224	234	468	1128	
1915	227	221	245	464	1157	

I was much interested in finding out why these 500 patients saw fit to consult over two doctors apiece, particularly in view of the fact that 50% were at once told they had consumption and at once made application for admission to a state sanatorium. The answers are tabulated below, the first table showing the number who consulted more than one doctor and the second, their reason for so doing.

TABLE X.

TABLE SHOWING NUMBER OF PATIENTS WHO CONSULTED TWO OR MORE DOCTORS.

N.	R.	L.	W.	R.	Total.	
35	36	37	55	163	Consulted only one physician.	
65	64	63	145	337	Consulted two or more physicians.	

According to these figures over 67% of the patients felt obliged to consult two or more doctors before they were satisfied. Their reasons were as follows:

TABLE XI.

TABLE SHOWING REASONS WHY 337 PATIENTS CONSULTED MORE THAN ONE PHYSICIAN.

N.R.	L.	W.	R.	Total.	
12	11	2	34	59	On advice of first doctor.
22	25	31	61	139	To be sure he was right.
12	22	16	28	78	Failure to get any better.
6	2	2	0	10	To get into a sanatorium.
13	4	12	22	51	Did not reply, or miscellaneous.

These figures are of great interest. One hundred and thirty-nine, or 41%, went to another doctor in order to be sure the first one was right, 78, or 23%, because they did not improve under the advice and treatment given by the first physician, and 59, or 17%, because the first physician advised them to do so. No particular comment is needed on these figures as they speak clearly enough for themselves.

Finally, I tried to find out how much it cost these 500 patients to ascertain what was the matter with them. The figures do not mean very much but are of some interest.

TABLE XII.

TABLE SHOWING AMOUNT PAID IN DOCTORS' FEES BY 421 PATIENTS WHO ANSWERED THIS QUESTION.

N.R.	L.	W.	R.	Total.
\$678	\$1246	\$1489	\$2022	\$5435

Although I do not place much faith in the accuracy of the answers given me, it was a distinct surprise that the total should have anywhere near approximated the amount given above, an average of over ten dollars per patient.

That the present situation is in every way an improvement, and in some respects a great improvement, over that of four or five years ago, is clearly shown; that there is still room for more improvement is shown with equal force. In commenting on this, I do not think that I can improve on the suggestions I made in my paper of 1911, as follows:

(1) Every patient, or at least every patient in whom there is the slightest suspicion of lung trouble, should receive a routine physical examination, with the patient stripped to the waist. Examination of the sputum should be a part of this routine.

(2) A "hemorrhage" should be considered as definitely indicating consumption unless there is clear evidence to the contrary, which there practically never is. Furthermore, the patient should be told so.

(3) Do not put off making a definite diagnosis until you find bacilli in the sputum. The real "early" diagnosis should be made long before bacilli appear in the sputum, and, indeed, it may be said that after bacilli appear there can no longer be an early diagnosis.

(4) Look more at the patient himself and his history and less at his lungs.

(5) In every doubtful case make the patient keep a record of his temperature and pulse, taken at the hours of 8, 12, 4 and 8, and report in a week.

(6) Talk plainly, openly and frankly with the patient, and if he has consumption see that he knows it. Err on the side of aggressive, early and efficient treatment.

(7) If the patient has consumption, try to get him in a sanatorium or hospital at once. Even if he will stay but a month or six weeks, he will there learn more than in a much longer time at home.

SUMMARY AND CONCLUSIONS.

1. In the early diagnosis of tuberculosis distinct improvement has been made during the past five years, as shown by the increased number of diagnoses of incipient tuberculosis without the presence of a positive sputum.

2. As far as can be judged from figures obtained at the Massachusetts General Hospital and the Boston Consumptives' Hospital, diagnosis in all cases was made very promptly in 1910, and likewise in 1915.

3. There has been a vast increase in the number of patients who have gone to a doctor before they suspected they had consumption; as shown by the figures, 77 out of 500 in 1911, and 408 out of 500 cases in 1915.

4. The chief symptoms for which patients consulted their physician in 1915 remain the same and in the proportion as was found to be the case in 1911.

5. In cases of hemorrhage fewer patients who first consulted their physician for this reason have been told that they did not have consumption in 1915 than in 1911. This is likewise the case in regard to the patients who were told that they did not have consumption on first consulting their doctor. The improvement in these two respects, however, is not as great as was to be hoped.

6. The diagnoses given to patients by their physicians who said that they did not have consumption in 1915 range themselves in the same main groups as was the case in 1911. It is not encouraging that, at the present time, out of 500 consumptives, over 50% were not given to understand by their physician that they had consumption.

7. There has been an encouraging increase in the number of applications for our State Sanatoria which were made by the physician either at the time of the examination of the patient or immediately after. In view of the length of the waiting list for the Massachusetts State Sanatoria this is an important thing for the physician to remember if he wishes to secure early treatment for his patient.

8. The number of physicians visited by these 500 patients in 1915 was approximately the same

as the number in 1911. Of the 1915 patients, 163 consulted only one physician, while 336 went to two or more physicians.

9. Of these patients who consulted two or more physicians, 41% went to another physician in order to be sure the first was right, 23% because they did not improve under the treatment given by the first physician, and 17% because the first physician advised them to do so.

10. According to the statements given by these 500 patients, it cost \$5,435, or approximately \$10 per patient, for them to obtain diagnosis and treatment for their condition.

Original Articles.

DISINFECTION OF SEPTIC JOINTS.*

By F. J. COTTON, M.D., F.A.C.S., BOSTON.

I THINK we have all begun of late years to understand that joints may be opened, with an approximately exact technic, without great risk, and that more or less reparative or remodelling surgery may be done within the joint. This is not the point, however, that I wish to make; rather I want to bring to your attention the proposition, not to be called a fact just yet, that the joint *itself*—the *closed joint*—has not a low resistance, but a high resistance to septic infections; that it seems to withstand very well indeed our usual active disinfectants, and is of a temper to accept and utilize their aid; that the joint has been a much-maligned entity.

I shall show, I think, that the joint cavity is far more capable of disinfection than the surrounding muscular and intermuscular spaces; it is, however, to be expected to show such capabilities only when it is kept apart—as a *closed joint*. We have all seen how slow and chronic a course may be taken by joints later found to be infected; infected not only by the gonococcus, but even by staphylococci and streptococci, of considerable (presumable) virulence.

All of us have seen the horrid course of infected knee-joints, treated by the ancient criminal method of drainage by wicks. They all had septic-pyemia of severe grade, and many died; it is my impression that most of them died as the result of prolonged and extensive suppuration between the muscle planes of the thigh and in the popliteal space, rather than from direct absorption from the septic joint.

In illustration, let me cite the case of an elderly woman who appears before me only too vividly in the northwestern corner of ward X, who had an infected knee (not very troublesome), with an effusion of some weeks' duration. One evil day we discovered, by tapping, that it was a streptococcus infection, and forthwith opened it, washed it out and *drained* it. There

was never any further sign of real trouble in the joint, but abscess after abscess formed in the thigh, and in time she died.

My first suspicion of the actual situation came from the results of operation on gonococcus knees about eight to ten years ago. We drained some of them then, but had come to let some of them drain themselves through an unclosed incision.

I think it was the uncertainty as to healing, the dread of an ingoing suppurative infection, and the fear of re-opening a track for infection by the obviously desirable early motion, that first made me sew up the capsule, after washing out the pus and the fibrin. These cases did well (did better than the others), and it then dawned on me that the joint might not be so hopeless a field after all; that it might have some power of self-protection, if given the chance.

Fortune presently presented some cases of mild *septic* infection; treated likewise, these also did well. Next came the obviously severe cases. Of these, such are presented as I have records of. Most of them I cannot trace; they have gone missing in the ruck of big hospital services. Unfortunately, the real importance of the matter hardly impressed me until lately; not until I realized that the other fellow was not following in what seemed to me the obviously logical line of procedure.

There were a number of cases, and I can recall but two failures. One was an accidental wound of the knee; streptococcus infection; washed with bichloride and sutured; infection recurred; wide-open drainage was needed, and saved life. The other was an infected knee in a small boy, of epiphyseal origin; staphylococcus; disinfection apparently succeeded, but, after some weeks, sinuses appeared. The joint closed, but partial fibrous ankylosis resulted. The rest of the cases have done well. The available cases are here recorded.

CASE 1. B. S.; girl of 10; ill over a week, after a slight trauma two weeks previously. Seen January 16, 1909. Knee swollen and tender; temperature 102.5°. Operation performed as soon as she could be gotten to the hospital. Incision into the tense quadriceps pouch, on the inner side of the knee. The joint was full of thick pus; from staphylococcus aureus, as it proved later. The joint was irrigated for 15 minutes with 1-15,000 of bichloride in salt solution, then flushed with simple salt-solution; the capsule was then accurately stitched together. In this case there was also a large popliteal abscess, which was opened and drained, and a sequestrum taken out later through the popliteal space. There was a little effusion in the knee after the primary operation, but this and all septic reaction disappeared promptly. The patient is now seventeen years old, and one can tell the knees apart only by the superficial scars.

CASE 2. Man of 40; had had an old osteomyelitis of the femur with some stiffness of the knee. For seven weeks previous to my seeing him, he had been ill, with a recurrence of the bone sepsis and with reopening of a sinus. For some days the knee

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had been swollen and very tender. He was gotten into the hospital and operated on promptly, the same technic being used as in Case 1; the capsule was closed in the same way. In this case, on account of the presence of so much pus from the sinuses, the skin was also sutured and sealed. An infected bone focus was cleared out at the time; later a small sequestrum was removed. There never was any trouble with the joint, and he recovered free joint motion of a range as great as he had had before. A bone sinus persisted.

CASE 3. A child of six years; admitted to the City Hospital for a septic elbow wound of ten days' duration. This did not seem to involve the joint. She went to the out-patient department ten days later, but 38 days after the injury, she came in again on my service with a draining wound, obviously going into the joint. There was motion of 30 degrees, with very little pain or spasm. Operation July 12 showed some loss of cartilage on the humerus, and a red, spongy, synovial membrane. The raw bone surface was painted with strong carbolic; then the joint was irrigated in the usual way and closed tight. Twelve days later the wounds were entirely healed and there was 45° of joint motion. Two months later, motion had largely disappeared. Adhesions in this case, owing to the cartilage loss, were inevitable. The point is that the joint infection after 38 days could still be disinfected and stay clean. The cultures in this case were mixed, staphylococcus predominating.

CASE 4. A boy of nine; knee-joint effusion after slight trauma. After a week, the joint was opened from either side and drains put in. They remained in until he was brought to me nine days later. Aug. 29, 1914, I operated, excising the edges of the drain holes, washing and suturing in the usual way. Despite the nine days of drainage, the synovial membrane showed little beside reddening. In this case, some weeks later, after 45° of motion had been regained, I broke up some adhesions. I got a report a month ago, saying that the knee is now perfect. The infection was staphylococcus aureus. Streptococcus said to have been found with the staphylococcus in the cultures taken by the man who drained the joint.

CASE 5. Boy of 8; septic elbow following diphtheria; joint tense and tender. Operated upon as usual; culture pure staphylococcus aureus. On February 16, 1915, five days after the operation, there was no limitation of motion, no swelling, no discharge; the open external wound was beginning to granulate. This joint I have seen recently; it is perfect.

CASE 6. A boy of seven; had a severe scarlet fever and developed mastoid infection and eventually a pus-elbow. I saw him April 19, 1915 and opened, washed and sutured in the usual way. The culture showed streptococcus only. This joint showed no signs of trouble after this, but on April 22 he showed signs of trouble in the right knee. This got worse, and April 26 the knee was opened and dealt with in the usual way. Here there were both staphylococci and streptococci. The joint did as usual, save for a little more recurrence of effusion and tenderness than usual for a few days. Sixteen days later he died of septic meningitis and pneumonia. Autopsy showed the knee to be sterile,

and sections of the synovial membranes showed practically nothing.

CASE 7. A boy of five; operated on for osteomyelitis of the tibia; he showed five days later an effusion into the other knee. This was opened and treated in the usual way. The culture was staphylococcus aureus. The capsule stayed tight, though the external wound was sluggish and there was some cellulitis about it for a while. The knee is now perfectly good with free motion. He is now finishing the repair of his new osteomyelitic tibial shaft, with a perfectly good knee on the other side.

These cases are enough, it would seem, to establish disinfection as possible and as harmless. I am told by some of my friends that it is impossible that infected synovial membranes should be disinfected; that washing out would do as well. This, to my mind, is book argument purely, and I can only say that, while I have seen a few cases of infected joints in children heal after simple washing, yet I have seen far more in which this method failed miserably. I am not sure that corrosive is the last answer, but I am sure that we should disinfect. The synovial changes in these cases are not great, and it seems likely that for some time the infection is mainly superficial, and is to be reached by disinfectant fluids. I do not know this to be true, but dare not do without disinfection. I am very sure, however, that when we have put the joint in the best shape we can, we *must shut it up*. Everyone knows that we cannot disinfect soft tissue wounds, and infection will spread in as well as out. *We must seal the joint to protect it*; this can be done, and it works. Drainage does not work. Murphy is absolutely correct in denouncing the drainage of joints as a crime. From the few of his cases that I have seen, it seems to me he fails to remove fibrin and other debris and stirs up more reaction than I do in my way. In the matter of principle, however, in the leaving of the joint as a *CLOSED CAVITY*, he is absolutely correct.

A CLASSIFICATION OF RENAL INFECTION, WITH PARTICULAR REFERENCE TO TREATMENT.*†

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MUCH confusion has surrounded the subject of renal infection. The sources of this confusion can be roughly summarized as follows:

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† This paper represents a brief statement of our views which will appear in more complete form later, at which time the evidence supporting our conclusions will be presented.

1. The very common and natural tendency to regard various perfectly definite stages in the same pathological process as separate pathological entities, because they give different clinical pictures.

Thus perinephritic abscess, when fully developed, may be found in a patient with a perfectly normal urine and a perfectly normal kidney on that side, as far as our rather gross methods of diagnosis will show, and yet that abscess may very probably have been the result of a staphylococcus infection of the kidney, and the diagnosis could have been made and the abscess drained before it showed any physical signs had the relation been understood. Again, pyelitis and pyelonephritis are generally regarded as quite apart from pyo-nephrosis, and yet the latter is an almost inevitable result of the former if the course is of the very common chronic type.

2. It has often been assumed that a similar clinical picture could be safely treated as if the underlying pathological condition were the same, but the results of this assumption have been disastrous. For instance: unilateral renal pain and tenderness, fever, chills and abundant pus in the urine with colon bacilli is a picture which may be produced either by acute pyelonephritis or by the infection of a hitherto unsuspected hydronephrosis and its sudden conversion into a pyonephrosis. But while the former requires only rest, heat and hexamethylenamin, the latter demands nephrectomy.

3. It has not been sufficiently recognized that a late destructive lesion may be the result of very different early causes and that its prevention would have required wholly different plans of action. The moderate sized subacute or chronic type of pyonephrosis may be the end result of a pyelonephritis, a hydronephrosis due to kinked ureter, or of obstruction of the bladder by prostate or stricture.

4. And, finally, we have grossly neglected careful, painstaking and early bacteriological study of the urine because we have been too apt to regard all renal infections as similar in their general management. No assumption could be more dangerous, for it has been clearly shown that with a similar renal background to start with, the infections of the kidney with the staphylococcus or with the colon bacillus run radically different courses and require wholly different management.

I believe I have not overstated the amount of confusion that exists in the mind of the average surgeon, and this, together with the fact that our knowledge of these infections has of late becomes better crystallized, is my justification for calling to your attention this always interesting subject.

The simplest and clearest classification of renal infections seems to me to be their division into two main groups.

1. Infection in kidneys having no previous gross lesion and not part of a general and in itself lethal septicemia.

2. Infection in kidneys having an antecedent gross lesion, such as stone in kidney or ureter or damage dependent upon obstruction of ureter or bladder.

The renal infections comprehended in Group 1 are, from the standpoint of their pathology, much the simpler because the problem is one of pure infection uncomplicated by forces, the amount of which is difficult to estimate and whose importance can, therefore, only be guessed at. But it is also for us the most interesting and important group, because in an uncomplicated field we can study the behavior of the kidney and its reaction to infection.

Group 2 includes a highly complicated set of conditions, because previous damage, while weakening the ability of the kidney to resist infection, cannot be asserted to have weakened all parts alike. Moreover, in this group, are included all the cases with obstructed or dilated ureters, and in these bacteria may reach the kidney by mechanism, such as retroperistalsis and even backwash, not possible under normal conditions.

Also from the point of view of the surgeon, these cases are not chiefly problems in renal infection, but rather in the management of the original lesion, be it the stone, the diverticulum, the prostate or the stricture. Therefore, partly because it would lead me too far afield, partly because of its complexity, but largely because a clear understanding of the problems of pure renal infection will enable us to manage intelligently the problems in Group 2, I shall devote my time here wholly to the class of infection coming in Group 1.

In this group there are three quite distinct types of infection, viz:

1. Those due to infection with the coccus group.

2. Those due to infection with the colon bacillus group.

3. Those due to infection with the tubercle bacillus.

The majority of coccus infections of the kidney are produced by either the staphylococcus aureus or albus, less frequently by the citreus.

This type of renal infection has been much misunderstood because it was early described as "septic infarct or multiple septic infarct," thus giving rise to the conception that it was of embolic origin. While septic infarct of the kidney is always a possible lesion it is generally only a part of an acute endocarditis, and rarely an important lesion. The error perhaps arose and has been perpetuated because pyramid-shaped lesions of the kidney of coccus origin are not uncommon, but this form is not proof of embolic origin, but only that the infection has rapidly involved the whole pyramid and has been

limited by the anatomical peculiarities of the kidney. In fact, most infectious lesions of the kidney show, at least microscopically, a marked tendency to the pyramidal form, and when appearing as macroscopic lesions, are evidence of virulence rather than of origin.

THE NATURAL HISTORY OF THE COCCUS LESION.

I believe the evidence all points to the arrival of the coccus at the kidney in the ordinary routine of excretion, since it is being generally recognized that various bacteria circulate in the blood stream with a frequency which might be described as considerable and cause oftentimes insignificant symptoms.

Having reached the kidney, the coccus, being a rapid pus producer, causes a suppurative glomerular lesion, hence the subcortical and cortical lesions, so characteristic of this type of infection. Frequently these little abscesses perforate the true capsule and reach the fat capsule, thus laying the foundation for extensive perinephritis and perinephritic abscess, the relation of which to coccus infection has only recently been made clear.

If the infection be massive and virulent, involvement of the whole pyramid may occur, and if many or most of the subdivisions of the kidney are invaded, the very severe and rapid disintegration, with symptoms resembling an acute abdominal lesion, will result.

It should be remembered in any discussion of renal infection that the process does not spread laterally beyond the limits of the reniculus in which it starts. If an active infection should occur in the glomeruli of only one reniculus, then a lesion pyramidal in shape and resembling an infarct might easily be produced, since the infection will spread only up and down, and once in the kidney can reach another division only by following the renal pelvis or the capsule. The pyramidal lesion, which has been described and even excised in these cases under the impression that it was an infarct, might be due to thrombosis of the vessels at the base of the pyramid by cocci reaching that level during the attempt at elimination.

Perhaps the most important characteristic of the coccus lesion, however, is the tendency, already referred to, to produce subcapsular lesions resulting in perinephritic abscesses in the fat capsule and perinephric abscess, without doing important damage to the secreting substance of the kidney and without serious lesions of the tubules. Under these circumstances very little pus will be found in the urine, and very little effect will be produced on renal function as we are able to test it. In fact, pus in the urine in any amount will occur only with extensive, though not rapid, necrosis of the pyramid. If should also be noted that with the coccus infections there is little or no infection of the renal pelvis, which is the portion of the kidney that most commonly contributes pus to the urine.

NATURAL HISTORY OF THE COLON BACILLUS LESION.

Renal infections with the colon bacillus have been misunderstood in part at least, because they have been dragged into the controversy of ascending vs. hematogenous infection and have been looked upon as largely of ascending origin. Following this unsound assumption, many writers have tried to make the lesions found in the kidney conform to the theory. I do not wish here to get involved in this controversy further than to state my opinion that, though ascending renal infections are generally of colon bacillus origin, colon bacillus lesions are generally not ascending but hematogenous in origin.

The most important renal lesion in these infections is of the pelvis, and this has been held by some writers to be evidence of ascension, in utter disregard of the well-recognized fact that in infections proved to be of hematogenous origin, the most important and lasting lesion is pelvic.

It is now generally accepted that colon bacilli circulate in the blood under many conditions and are excreted by the kidney. Thus they are frequently in contact with kidney tissue, and, in the absence of gross lesions due to obstruction of the lower urinary tract, the hematogenous route is altogether the most probable, to say nothing of the work of Crabtree and others who have proved it beyond doubt in certain instances. The hematogenous origin of the infection of the kidneys in this group has been proved with far more certainty as concerns the colon bacillus than for the coccus, but for the latter it is generally accepted.

The colon bacillus, like the coccus, produces its lesions during the attempt at its excretion. The character of the lesions produced in the kidney by the colon bacillus differs from those produced by the coccus, because of the essentially different habits of the organism. Being a mildly pathogenic organism, it passes the glomerulus, causing little or no effect, acts first at the level of the convoluted tubule, where it causes only moderate lesions without suppuration, and shows most of its action on the mucous membrane of the pelvis, where it causes a well-marked pyelitis with a strong tendency to become chronic. From this pyelitis in the chronic form, recurrent infections of the kidney occur, involving both tubules and interstitial tissue, and thus in time the kidney may be largely destroyed, partly by scarring of the kidney itself and partly by the pressure exerted by the thickened and more or less obstructing pelvis and upper ureter. In maintaining its grip upon the kidney, this bacillus has a distinct advantage over all comers through his ability to grow and live happily in the urine.

In contradistinction to the coccus, the colon bacillus produces little cortical disturbance, little perinephritis except that due to reinfection from the pelvis, much disturbance in the tubules and marked pyelitis. From this it follows that

there is very marked effect on renal function and very marked pyuria. The immediate effect of the infection is never as severe as the worst cases due to the coccus, the subacute stage is neither as prolonged nor as severe as with the coccus, but recovery cannot be expected with the same certainty after the acute stage has passed. The coccus either produces a lesion that demands operation or gets well; the colon bacillus lesion rarely demands operation, but often does not get well.

THE LESIONS OF TUBERCULOSIS.

Renal tuberculosis is so much a field by itself, has attracted so much attention, and is, on the whole, so well understood that it will be mentioned here only for the purpose of comparison.

Accumulating evidence seems to me to show that in the majority of cases the tubercle bacillus reaches the kidney through the blood in the process of excretion, as do the cocci and colon bacilli, though in occasional cases other methods of entrance may be admitted.

The behavior of the tubercle bacillus in the kidney resembles the colon bacillus rather than the coccus, but it is fundamentally different from either. Not being a rapidly growing organism or a pus producer, it passes the glomerulus and produces its most marked lesion at the level of the convoluted tubule. This is at the start a closed lesion and may remain so for a considerable time, giving rise to the type of lesion known as "closed tuberculosis," in which the tubercular nodule, though going on even to caseation, does not communicate with the renal pelvis and shows practically no evidence in the urine. Such a lesion is, however, the exception, and in the vast majority the process reaches the renal pelvis early, either by ulceration or by direct infection by bacilli which have been excreted. Pyelitis is an early and marked lesion in tuberculosis, and is most marked about the tips of the pyramids. The bacilli also travel toward the cortex from the central lesion, probably following the intertubular tissues. They here produce miliary abscesses, invade the fat capsule, cause perinephritis, abscesses in the fat capsule and perinephric abscess. In all these later respects they follow the habits of the coccus, though their method of reaching the cortex is different, but there is evidence to show that they not only produce these capsular lesions, but extend to other portions of the kidney, and even to the opposite pole by moving along the lymph spaces of the capsule and there re-enter the kidney and produce new cortical lesions.

As regards the progress of the disease, it differs from all other infections in that the efforts of nature to effect a cure are probably never successful, and that cure results only by removal of the whole kidney, either by nature (caseation) or by art (nephrectomy).

MIXED INFECTIONS.

Though perhaps properly to be excluded from this discussion because there is a previous gross lesion, I am inclined to note briefly the characteristics of the mixtures of the three just described infections. They occur in all possible combinations,—tubercle bacillus and coccus, tubercle bacillus and colon bacillus, and colon bacillus and coccus; and it commonly occurs that the more chronic form becomes infected with the more acute, and takes on the latter's clinical picture.

Thus a kidney with a chronic, often symptomless, tubercular infection, becomes the seat of a coccus infection and promptly the picture of the coccus infection is thrown on the screen. The fever, chills, renal pain and tenderness, the perinephritis and even perinephric abscess develop according to schedule, but the picture is confused by the presence of pus in the urine and staphylococci, unless the tubercular lesion be of the rarer closed form, and the conclusion is erroneously drawn that we are dealing with a coccus infection with a grossly purulent urine. Such a case has been recently under our observation, and though the diagnosis of coccus infection with perinephritis and perinephric abscess was correctly made, the small chronic tubercular lesion was overlooked.

The combination of tubercle and colon bacillus is confusing, because it departs but little from the clinical picture of colon types of infection, and the tubercular lesion is generally not suspected.

There are only two diagnostic manoeuvres by which the error can be corrected,—cystoscopy with the discovery of a lesion about the ureter orifice which suggests tuberculosis, and the recovery of the tubercle bacillus from the urine. Neither of these is commonly successful in the cases in which the younger infection is acute and the older is of the mild type, because the lesion of the ureter orifice may be absent or slight, and is much confused and obscured by the recent swelling, while the finding of the tubercle bacillus in a urine full of other virulent organisms is very difficult whether stains or pig inoculations be used.

The combination of the colon bacillus and the coccus has given rise to much confusion and some acrimonious discussion; because, if the coccus be grafted on the bacillus infection, the clinical picture becomes that of a very severe colon lesion plus perinephritis, and leads to the opinion that the bacillus has produced a lesion of the kidney more serious than it is in fact capable of causing. The error has been more deceptive because the observation has been apparently confirmed by the bacteriological study. When both the coccus and the bacillus are actively concerned in a kidney infection, cultures from the urine, as generally made, may show only the colon, and the coccus is overgrown and lost, or since the colon grows actively

in the urine, he soon overshadows the coccus if the urinary sediment be stained for bacteria.

This, I believe, accounts for reported cases in which a colon bacillus infection of the kidney is alleged to have been as virulent and menacing as the coccus type and to have produced similar gross lesions and required nephrectomy. The error is serious, and has led to the sacrifice of kidneys which might have been saved. It can be avoided by the careful examination of the stained sediment of *very fresh* urine, by the very careful study of cultures from fresh urine, and comparing these results with the clinical picture. The importance of recognizing the mixed lesion is very great, since it may profoundly affect the plan of treatment.

PLAN OF TREATMENT BASED UPON THE PATHOLOGY.

If the foregoing views of the pathology of these various lesions are sound, and though the time at my disposal precludes a discussion of the evidence on which they are based, I believe them to be thoroughly supported, it then follows that they must profoundly and fundamentally affect treatment.

The coccus type involves primarily the cortical portions of the kidney, at its worst is more acute and not very rarely fatal if left to itself, and when subacute or chronic is peculiarly liable to produce cortical, capsular and perinephric abscess. Since it involves the secreting portion of the kidney far less than does the colon type of lesion, does not importantly involve the pelvis, and since the organism does not grow as actively in the urine, it is far less amenable to treatment by drugs, and in our experience has run its course practically uninfluenced by such therapeutic methods. Both clinically and experimentally the coccus seems little, if at all, annoyed by any of the formaldehyde-containing drugs, and though it has been suggested that they may be affected to their disadvantage by some of the aniline dyes, the proof of this is still lacking.

It therefore follows that, the diagnosis of a coccus lesion having been made, the treatment, outside of general measures, is largely surgical. In the so-called hyperacute cases, which have largely abdominal symptoms and are commonly mistaken for acute pancreatitis or some lesion of the gall-bladder or stomach, it is of essential importance to demonstrate the presence of the coccus in the urine, though it may be absent in the very early stages. The decision for or against operation must be based on the estimated ability of the patient to localize the infection and avoid fatal septicemia. If operation is undertaken at this stage of the disease, nephrectomy is likely to be necessary, and will be generally successful.

The most difficult decisions are required in the subacute cases with the picture of enlarged, tender kidney, persistent fever of the remittent

type, and little change in general condition from day to day. These cases require operation, but whether it should be nephrectomy, nephrotomy or removal of the true and fat capsule and drainage of perinephric infection, will depend on local conditions, and is very difficult of correct solution. Roughly, three types of conditions will be found: (1) much perinephritis, with abscesses in the fat capsule and outside of it, but with comparatively little renal damage; these cases *may* be cured by removal of the capsules and drainage of the wound. (2) Groups of subcortical and cortical abscesses, superficial and not widespread, associated with perinephritis; these cases *may* be cured by decapsulation and local nephrotomy, but often require secondary nephrectomy. (3) Extensive widely disseminated abscess formation, occasionally areas of pyramidal necrosis and much perinephritis; these generally require nephrectomy, though wide nephrotomy may be tried.

The most interesting, because generally overlooked lesion, is that which results in the slow-forming perinephric abscess. These patients generally have a mild febrile attack with some renal pain, often resembling pleurisy, which promptly subsides, but leaves them feeling somewhat miserable with a variable unexplained fever. In the past these patients have in the course of the next few weeks slowly developed signs of a perinephric abscess and ultimately come to operation. In the light of present knowledge, the urine should early be studied for cocci, and should these be found and demonstrated to come from the kidney on the side of the symptoms, perinephric abscess may be diagnosed and drained long before the physical signs would make diagnosis possible.

The management of the colon bacillus type of kidney infection will differ radically from that applicable to the coccus type, since the lesion is most violent in the pelvis, though perhaps most serious in the tubular area. It does not and will not produce the lesions which require surgery,—perinephritis and perinephric abscess. Furthermore, since it involves the secreting portion of the kidney, it is much more readily amenable to treatment by drugs given by mouth. That the action of these drugs is largely upon the bacilli growing in the urine is probable. The only drugs which with certainty act upon the colon bacillus are those containing formaldehyde, and those only in a urine of considerable acidity. It has been shown by more than one observer that the decomposition of urotropin and similar compounds is due to the acidity of the urine, and takes place largely in the urine after excretion. If this is believed to be wholly sound, it necessarily follows that practically the whole action of these drugs takes place in the bladder, and that at the level of the kidney, and more so at the level of the convoluted tubule, there is little or no inhibitory action. This view has been confidently asserted by Hin-

man, but seems to me to be at variance with clinical observations. It is a matter of common knowledge that in a patient with a fresh, acute, severe colon bacillus infection, the administration of urotropin efficiently, with the maintenance of an acid urine, will within twenty-four hours eliminate the fever, diminish the tenderness and stop the chills. I am unable to conceive how such a result could accrue from a drug which acts only on the bacilli in the bladder, and while I am prepared to admit that its most powerful action is in the lower urinary tract, I cannot avoid the conclusion that it acts at the level of the renal pelvis, and probably even in the convoluted tubule.

There is no lesion produced by the colon bacillus which corresponds in severity to the hyperacute lesion produced by the coccus. I believe it to be doubtful whether there is any lesion of the kidney produced by the colon bacillus, which in its acute form cannot be managed by formaldehyde-containing drugs, properly administered. The serious lesions of the kidney produced by the colon bacillus, are the late result of the infection, the more or less complete destruction of the kidney, which amounts practically to a pronephrosis. The most important discussable problems of colon bacillus infections are those concerning the final removal of the bacilli from the renal pelvis. A series of observations during the last year bear interestingly upon this question. The test of final removal of bacilli is, of course, persistently sterile bladder urine. In this series it early appeared that the most acute cases, that is to say, those with severe onset and high temperature, recover with the greatest certainty, whereas those with mild beginning were apt to become chronic. This seems to point to the development by the acute cases of a degree of immunity sufficient to protect the kidney, whereas the subacute cases develop no such immunity and the process becomes chronic. These observations, if confirmed, open up the interesting possibility of being able to increase the acquired immunity of these subacute cases by the much more carefully regulated and efficient use of vaccines. Undoubtedly the important element in winding up these infections is the very careful administration of formaldehyde-containing drugs. As now given, they generally leave a considerable period in the twenty-four hours when there can be no formaldehyde in the urine, and during this period the bacilli may well take on more active growth. I am convinced that these drugs should be given every four or five hours throughout the twenty-four, that their dosage should be checked up by the test for formaldehyde in the urine, and that their weak decomposition should be increased by the administration of acid sodium phosphate, where the urine is but mildly acid. Some cases at least of colon bacillus pyelonephritis are allowed to become chronic through inefficient medication. Of those which remain, a further

study of the possibility of vaccine therapy is clearly worth while. Where the bacilli cannot be removed from the urine relapses will occur, and in the present state of our knowledge can be avoided only by the more or less consistent administration of formaldehyde-containing drugs.

To sum up this brief survey of renal infections: The lesions produced by the coccus are far more likely to require surgical treatment because of their location and the tendency of the organism to pus formation. Such surgery, if required, will come during the comparatively early stages of the infection. As opposed to this, the colon bacillus infection produces a lesion which rarely requires surgery in its early stages, which is comparatively amenable to medical treatment, but which has a remarkable tendency to become chronic, and may in time produce a lesion of the kidney which so completely destroys that organ that nephrectomy becomes necessary.

I have omitted entirely a consideration of the treatment of renal tuberculosis, because it consists wholly in the removal of the kidney when the diagnosis has been made.

B. DYSENTERIÆ AS A CAUSE OF INFECTIOUS DIARRHÆA IN INFANTS.*

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AND

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FLEXNER and his co-workers in 1904¹, after a very careful study of the summer diarrheas of infancy, showed that the dysentery bacillus could be isolated from the stools of the great majority of these cases and concluded that this organism was the cause of the trouble. Doubt has been thrown on this conclusion by a number of workers who have tried to incriminate other bacteria as causing at least a certain number of cases of diarrhœa and less and less attention has been paid to the dysentery bacillus. During the summer of 1914 the authors² examined the stools of infants suffering from diarrhœas and showed that in the severe cases the dysentery bacillus was more constant in its presence than the other assumed etiological organisms and that the evidence in its favor as being the cause of the trouble was better than for the other bacteria. There were, however, a certain number of cases in which it could not be isolated; therefore during the summer of 1915 we decided to make a more thorough search for it, and in those cases in which it could not be

* Received on March 1, 1916, for publication.

isolated, to test for agglutinins for it in the blood.

The methods used in isolating the dysentery bacillus have been described fully in the paper referred to. Briefly they are to make streaks from the stool on previously prepared Endo-agar plates, and after these have been incubated over night, transfers are made from all suspicious colonies. The cultures that give the typical reactions in the carbohydrates, that are non-motile, and that are agglutinated by a polyvalent anti-dysentery serum (mannit-fermenting strains) are called dysentery. Several plates were made from each stool and where the first examination was negative, repeated attempts were made to isolate the dysentery bacillus.

During the summer of 1915 the hospital admitted eighty-four cases with a clinical diagnosis of infectious diarrhea. Nine of these cases have been excluded from our results, one because it was convalescing and the other eight because they were not examined bacteriologically.

In the seventy-five cases studied the dysentery bacillus was recovered from the stool in fifty-one instances, or sixty-eight per cent. In five other cases we were unable to isolate it from the stool, but found it in cultures made at autopsy, thus making a total of fifty-six instances, or seventy-four and six-tenths per cent. of the total number of cases in which the dysentery bacillus was found.

Even in typical acute cases of infectious diarrhea the dysentery bacillus may be difficult to isolate. In Table I we give the number of examinations made in order to isolate it in the fifty-six cases.

TABLE I.—ISOLATION OF THE DYSENTERY BACILLUS.

B. Dysenteriae Isolated at	No. of Cases.	Per Cent.
First examination.....	30	53.5
Second examination.....	12	21.6
Third examination.....	5	8.9
Fourth or subsequent examination.....	4	7.1
Autopsy not during life.....	5	8.9

As will be explained later, a number of cases in which we were unable to isolate the dysentery bacillus from the stools, gave a positive agglutination test for this organism, and we assumed that it was present. In order to emphasize the difficulties in the isolation of this organism, we give, in Table II, the examinations made in these cases.

TABLE II.—NEGATIVE BACTERIOLOGICAL EXAMINATIONS OF STOOLS OF CASES, THE SERUM FROM WHICH GAVE A POSITIVE AGGLUTINATION TEST FOR THE DYSENTERY BACILLUS.

No. of Cases.	No. of Examinations of the Stools.
1	2
1	3
1	4
2	5
4	6 or more

As stated in our previous paper, we have not found the mannit-fermenting group of dysentery bacilli to be constant in their action on car-

bohydrates other than dextrose and mannit, but we studied the organisms isolated and found that seventy-six per cent. belonged to the type of Hiss-Y, thirteen per cent. to the Flexner, and ten per cent. to the Strong type. From one case that showed an organism belonging to the type Flexner, a culture was isolated that in its action on carbohydrates corresponded to the Shiga type. Thinking that all of these cases might primarily be Shiga infections, with the variants appearing in greater numbers, we made a number of Endo-plates from the wall of the cecum of three cases. From each case twenty or more colonies of the dysentery bacillus were isolated and studied, and in every instance they all belonged to the mannit-fermenting group.

In as many instances as possible the sera of those cases in whose stools we were unable to find the dysentery bacillus, were tested for agglutinins for this organism. The cultures used for agglutinogens were old laboratory stocks and cultures isolated the previous year from infants' stools. The blood was drawn at least two weeks after the onset of the disease and the test was made after it had stood one or two days in the refrigerator. The macroscopic test was used throughout the work.

The tests made on known positive cases are given in Table III. While they are few in number, they enable us to draw the conclusions that a negative reaction is of little value and that several cultures must be used as agglutinogens. The first point is especially striking in Case 2012, where a negative agglutination reaction was obtained with ten cultures, yet a positive reaction in a dilution of 1/640 was obtained with the dysentery culture isolated from the patient's stool.

In Table IV are given the results of tests made on cases not having the symptoms of infectious diarrheas. They are uniformly negative, but as only four cultures were used in all but one case, no conclusions can be drawn from these results.

The results of the tests on the fourteen cases of clinically infectious diarrhea, from the stools of which we were unable to isolate the dysentery bacillus, are given in Table V.

It will be seen that nine of these cases gave a positive reaction, and it is quite possible that more would have been positive had more cultures been used in the tests. Case 2065 is of interest, because repeated examinations of the stool were negative for the dysentery bacillus but did show great numbers of Morgan's Bacillus No. 1st; yet the serum from this case did not agglutinate two cultures of the Morgan Bacillus in dilutions of 1/20, while it agglutinated two cultures of the dysentery bacillus in dilutions of 1/320. On examination of Tables III and V it will be seen that Culture IX gave the greatest number of positive results, but it would not be safe to use this culture alone, for in two cases

TABLE III.—AGGLUTINATION TESTS ON KNOWN POSITIVE CASES.

Case Number.	Clinical Diagnosis.	B. Dysenteriae Isolated from Stool.	LIMIT OF AGGLUTINATION FOR DYSENTERY STRAINS.										Omn. Culture
			Shiga- L.	Flexner Harris.	Class. I Morgan.	Hiss Hiss-Y.	VII Hiss-Y.	VIII Hiss-Y.	IX Strong.	X Strong.	XI Flexner.	XII Flexner.	
2012	Infectious diarrhea	Yes	20—	40—	20—	40—	20—	20—	20—	20—	40—	40—	640
2045	"	"	....	....	....	....	20—	20—	20—	....	20—	....	....
1st test													
Aug. 4							30—	....	30—	30—	30—	....	....
2d test													
Aug. 15													
2097	"	"	"	20—	320	320	80	20	80	320	40	160	320
2103	"	"	"	20—	320	320	80	20	160	20	160	20—	80
2123	"	"	"	20—	40—	20—	40—	320	40	320	40	20	640
2186	"	"	"	....	40—	....	....	....	40—	40—	40—	40—	....

In tables III, IV, and V, the figures are the denominators of the highest dilution in which agglutination occurred. Those figures followed by a minus indicate that there was no agglutination in this the lowest dilution used. For example, 320 indicates that there was agglutination in a dilution of $\frac{1}{320}$ and 20— indicates that there was no agglutination in a dilution of $\frac{1}{20}$.

TABLE IV.—AGGLUTINATION TESTS ON KNOWN NEGATIVE CASES.

Case Number.	Clinical Diagnosis.	B. Dysen- teriae Iso- lated from Stool	Flexner- Harris.	LIMIT OF AGGLUTINATION FOR DYSENTERY STRAINS.					
				VII. Hiss-Y.	VIII. Hiss-Y.	IX. Strong.	X. Strong.	XI. Flexner. "Powers."	2012
2003	Fermental diarrhea.....	No	....	60—	....	30—	30—	30—	....
2076	" " " " " " " "	"	....	30—	....	30—	30—	30—	....
2107	" " " " " " " "	"	....	20—	....	20—	20—	20—	....
2125	Regulation of feeding....	"	....	20—	....	20—	20—	20—	....
2127	" " " " " " " "	"	....	20—	....	20—	20—	20—	....
2131	Fermental diarrhea.....	"	....	20—	....	20—	20—	20—	....
2249	" " " " " " " "	"	40—	40—	40—	40—	40—	40—	40—

TABLE V.—AGGLUTINATION TESTS ON CLINICALLY POSITIVE BUT BACTERIOLOGICALLY NEGATIVE CASES.

Case Number.	Clinical Diagnosis.	Dysenteriae Isolated from Stool.	LIMIT OF AGGLUTINATION FOR DYSENTERY STRAINS.									Morgan. I & II.
			Flexner-Harris.	VII. Hiss-Y.	VIII. Hiss-Y	IX. Strong.	X. Strong.	XI. Flexner.	XII. Flexner.	" Powers." 1912		
2001	Infectious diarrhea	No	.....	20—	20—	20—	.....	20—	.....	.....	.....	
2028	"	"	.....	160	160	320	.....	80	.....	.....	.....	
2040	"	"	.....	50—	.....	50—	50—	50—	.....	.....	.....	
2062	"	"	.....	40	40	160	.....	20	.....	.....	.....	
2065	"	"	"	320	.....	320	80	20	.....	.....	20—	
2067	"	"	"	50—	.....	200	200	50	.....	.....	.....	
2072	"	"	"	20	40	320	.....	80	.....	.....	.....	
2074	"	"	"	20	.....	160	320	40	.....	.....	.....	
2128	"	"	"	40	.....	320	80	20—	.....	.....	.....	
2152	"	"	"	20—	.....	20—	.....	20—	.....	.....	.....	
2179	"	"	"	50—	.....	50—	50—	50—	.....	.....	.....	
2244	"	"	"	40—	40—	80	320	80	40—	40—	40—	
2253	"	"	"	40—	40—	320	80	40—	320	40	40—	

that were known to be positive, this organism was not agglutinated in low dilutions.

The following observations on *Bac. welchii* are of some interest, for it is still believed by some^{4,5} to be one cause of infectious diarrhea. Using the milk test, seventeen of our cases of dysentery were negative for *Bac. welchii* on the first examination. At the end of a week five of these cases showed a positive reaction, at the end of the second week the reaction was positive in

ten cases, by the end of the third week fifteen were positive, and at the end of a month all the cases gave the positive milk test. This confirms our statement of the previous year that while the milk test for *Bac. welchii* may be negative during the acute stages of infectious diarrhea, it tends to become positive as the patient improves. We have yet to see one of these cases in which we could get any evidence that this organism is the cause of the disturbance.

SUMMARY AND CONCLUSIONS.

Negative bacteriological and agglutination tests for the dysentery bacillus in cases of infectious diarrhea of infancy are of comparatively little value, and in making the agglutination test a number of cultures must be used for the agglutinogens. In spite of these facts the dysentery bacillus was isolated from seventy-four and six-tenths percent. of the cases studied. Only fourteen of the nineteen bacteriologically negative cases were studied for agglutinins, and sixty-four and three-tenths per cent. of these, or twelve per cent. of the total number, gave a positive reaction, thus making a total of eighty-six and six-tenths per cent. of the seventy-five cases in which we have good evidence that the dysentery bacillus was present. We have been unable to obtain any evidence that *Bac. welchii* is ever the cause of infectious diarrhea and all of our results point to the dysentery bacillus as the etiological agent. In our cases all these bacilli belonged to the mannit-fermenting group.

In spite of the apparent scarcity of dysentery bacilli in the feces, we believe that they are the cause of infectious diarrhea of infancy for the following reasons: (1) their universal association with the condition; (2) the great numbers of these organisms in the mucosa of the cecum; (3) the sick individual produces immune bodies against them while such bodies, specific for the other assumed etiological agents, have not been demonstrated; (4) experimentally they are known to produce a diarrhea.

We wish to thank Dr. Henry I. Bowditch and the other members of the staff of the Boston Floating Hospital who did everything in their power to aid us in making this study.

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INTRA-SPINAL INJECTIONS OF BICHLORIDE OF MERCURY.

By EDWARD LIVINGSTON HUNT, M.D., NEW YORK.

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At a recent meeting of the section on medicine of the New York Academy of Medicine, I reported forty cases of spinal syphilis which had been treated by the intra-spinous administration of mercurialized serum, and five cases which had been treated by the direct intra-spinous injection of bichloride of mercury. The forty cases

I was able to give fairly definite reports on, and recited some conclusions. Since then I have treated twelve additional cases by the direct administration of bichloride of mercury into the spinal fluid.

The method of administration was as follows: Weigh out one gram of Merck's bichloride of mercury; dissolve this in 770 c.c. of distilled water; sterilize the whole. One cubic centimeter of this solution contains .0013 gram of bichloride of mercury, which is equal to 1/50 of a grain. Draw off 15 c.c. of spinal fluid. Discard 5 c.c., and to the remaining 10 c.c. add 1 c.c. of the bichloride solution previously prepared. Then re-inject directly into the spinal canal, very slowly, the whole 15 c.c. The time consumed in performing this re-injection should be about four minutes. To minimize the handling of the solution and so decrease the chances of infection, it is best to draw the 1 c.c. of the bichloride solution directly into the syringe, and mix the two solutions there in the hypodermic. Then re-inject the entire 15 c.c. The patient should then be put back to bed, and for the first five or six hours, the foot of the bed should be elevated. This precaution is taken in order to diminish the tendency of the patient to acquire a headache.

The twelve treated all come under the head of syphilis of the nervous system. They consisted of cases of general paresis, tabes, taboparesis, hemiplegia, optic nerve atrophy, and one case of brain syphilis with complicating hemiplegia. These cases were given either 1/64 or 1/50 of a grain of bichloride of mercury, at each intra-spinous injection. The usual plan was to give 1/64 at the first dose, and then 1/50 at subsequent doses. In a few cases, however, the maximum dose of 1/50 was given at the beginning. The injections were approximately at intervals of two weeks; in a few instances it was not possible to give them exactly on the day, but an effort was made to have the dosage as nearly as possible every fifteen days. All of these patients were at the same time being given a mixed antisyphilitic treatment, that is to say, potassium iodide by mouth and on the alternate weeks hypodermic injections of the salicylate of mercury, of a grain or less. In a few of these patients it was not possible to obtain definite results, but in the large majority improvement was manifest. The reaction was nearly always present, of varying extent. In some, the pains became very severe, lasting two or three days, in others the shooting pains in the legs were moderately increased for a few hours. In a very few of the cases there was persistent after-vomiting. In one there was very marked involvement of the sphincters. This patient lost control of his bladder for three weeks, and of his intestinal tract for two weeks. He is, however, growing stronger and there is every indication that in time he will control both functions.

The first case, J. C., was one of tabo-paresis, who complained of pains in both legs and had been unable to walk for the past ten years. The laboratory reported a positive Wassermann on both the blood and the spinal fluid, a cell count of 23 and a ++ globulin. This patient was given five injections of bichloride of mercury, the first two 1/64 of a grain, and the last three 1/50 of a grain. After the second treatment the pains in the legs stopped and the patient felt distinctly better. At the end of the fifth injection, December 1, the Wassermann was still positive, the globulin ++, but the cell count had dropped to 11, and the patient considered that he had been very materially helped.

The second case, S. V., was a man of 49, who admitted a specific history twenty years ago. His chief complaint was nervousness, weakness, and inability to use his hands as a result of a very marked tremor. His pupils were Argyll-Robertson, his knee jerks were present, and there was a marked facial tremor. The laboratory reported on the third of September, the blood Wassermann negative, the spinal fluid Wassermann positive, a ++ globulin, and 130 cells. He was at once started on bichloride of mercury, 1/50 of a grain, given in his own serum. A marked reaction followed with pains in the legs and vomiting. Two weeks later he was given 1/64 of a grain of bichloride of mercury directly in the spinal fluid, and two weeks after, a third injection of 1/50 of a grain in the spinal fluid direct. Following the third dose, there was some headache, pain and marked shooting pains. On November 19, he was given the fourth dose of bichloride of mercury in the spinal fluid, from which he had a slight reaction. At that time the laboratory reported ++ globulin, positive Wassermann and only 9 cells. The reaction in this patient was more marked after the administration of the bichloride of mercury directly into the spinal fluid than in the one dose administered from the mercurialized serum. The character of the reaction in his case was wholly one of headache, nausea and pain. There was no interference with the urine or bladder. On the twenty-third of November this patient said the tremor was much less marked, so that now he could button his coat, whereas formerly he was unable to do so. He had no pains in his legs and considered that he was very much benefited.

The third case, that of F. S., was a man of 22, who admitted a specific history three years ago, and who, three months ago, sustained a hemiplegia of the left side. He complained of very severe boring pains in the back of the head, and gave the appearance of a man who was sick and suffering. The laboratory reported a weakly positive blood Wassermann, a moderately positive Wassermann of the spinal fluid, a ++ globulin, and 330 cells. He was given two intra-spinal treatments of 1/50 of a grain each. As a result there was no improvement in the paralysis, but the headache completely disappeared. His spinal fluid remained positive, but the cell count dropped to 160. The reaction in this patient was more marked than in any of the others, as he had terrific pains in both legs.

The fourth case, M. L., a man of 42, admitted a specific history twenty years ago, and for the past four years had complained of shooting pains in the legs and difficulty in walking. He has pupillary

changes, optic nerve atrophy, absent knee jerks, and a Romberg. A few months ago, when he began to lose his eyesight, he was given "606"; the loss of eyesight became much worse. He was given 1/50 of a grain of bichloride of mercury intra-spinal twice, and at the end of a month his cell count dropped from 37 to 13, the Wassermann remained positive and the globulin +. He had a fairly severe reaction after each dose, but no sphincter involvement. At the end of a month he was of the opinion that the treatments had helped the pains in the legs, but felt that the reaction was so great that he was not willing to have any further treatment.

CONCLUSIONS.

The conclusions which I have reached in the twelve cases reported here are neither final nor conclusive. They are, however, worthy of consideration. I fully realize that the number of cases is not sufficient, and that the time in which they were followed is not long, nor were a sufficient number of intra-spinal injections administered. However, the conclusions drawn were as follows:

1. The spinal fluid Wassermann remained unchanged even after three or four treatments.
2. The globulin did not undergo much, if any, change; occasionally a ++ became a +.
3. The reaction after the treatment was usually not severe, and generally amounted to shooting pains in the legs of marked severity.
4. There was always a possibility of getting a considerable degree of rectal or bladder sphincter disturbance which was, however, temporary.
5. The cell count was almost always lowered.
6. The shooting pains in the legs were almost invariably relieved.

In other words, the administration of bichloride of mercury directly into the spinal fluid gives practically the same results as the administration of mercurialized serum. It has the advantage over the latter of simpler technic, shorter methods, and easier administration, with less opportunity of infection. The great advantage, to my mind, lies in the fact that the operation is simpler, and there is less involvement on the part of the laboratory. Both methods, that of the mercurialized serum and that of the bichloride directly injected into the spinal fluid, can be considered as valuable substitutes for the administration of salvarsan. Whether the results will be as permanent as the latter remains to be seen.

It is certainly fair to say that no ill results can accrue from the direct intra-spinal injection of 1/50 of a grain of bichloride of mercury in syphilis of the nervous system.

It is well to make the initial dose small; it is therefore better to begin with a dosage of 1/64 of a grain and later increase it to 1/50.

In no instance was any change manifest in the reflexes, but change was evident in tremors, in the pains, in the spinal fluid content, and especially in the general condition of the pa-

tient. There is no doubt that any of these injections, salvarsan, mercurialized serum, or bichloride of mercury, have a very good moral effect on these patients, and for that reason alone, should be encouraged.

Clinical Department.

LOSS OF SIGHT FROM RETROBULBAR NEURITIS DUE TO ACCESSORY SINUS DISEASE, WITH REPORT OF TWO CASES.*

BY LEON E. WHITE, M.D., BOSTON.

RETROBULBAR NEURITIS is, as the name indicates, an inflammation of the optic nerve behind the eye. The optic nerves, after mingling and crossing in their peculiar manner at the chiasm, pass through a bony canal, the canalis opticus, to the eye. This canal varies greatly in position, being, in some cases, separated from the sphenoidal sinus or the posterior ethmoid cell by only a tissue paper thickness of bone. The relations of this canal to these sinuses are vital to a clear comprehension of the way infection reaches the nerve. The body of the sphenoid bone is usually hollowed out by the two sphenoidal sinuses, but in some cases these sinuses are rudimentary and only fill the lower anterior portion of the body while the posterior ethmoid cells extend externally and occupy a large portion of the body of the sphenoid.

Onodi, of Budapest, has written on and studied this relationship most painstakingly and efficiently. In 1908 he said, "For ten years I have been investigating the more delicate construction of the accessory cavities and the relation of the optic nerve to them." His results furnish the anatomic foundation for the theory of blindness from accessory sinus disease. He published an atlas in 1911 with natural size plates made from photographs showing 38 different morphologic findings on the relations of the optic nerve to the sphenoidal sinus and ethmoid cells.

Normally the canal for the optic nerve is separated from the sphenoidal sinus and posterior ethmoid cell by a thin but dense layer of bone; otherwise disturbances in vision would be much more frequent, as we all see cases with marked disease of these sinuses yet with perfectly normal vision. The unusual cases, those with very slight, or, possibly through some dehiscence, no protection to the nerve, are the ones where visual disturbances may be expected.

To quote Onodi again. "Our observations have shown that the wall between the last eth-

moid cell and the canalis opticus is nearly always as thin as tissue paper; dehiscences in the walls of the accessory cavities have been found, there the diseased mucosa may come into direct contact either with the dura mater or the optic nerve sheath."

In 1886 Berger and Tyrman reported their findings in the examination of the differences in the partition wall between the optic nerve and the sphenoidal sinus. Thus, in one section the partition on both sides was of tissue paper thickness; another section showed both sides with very thick walls, while a third section showed one side with tissue paper thickness while on the other side there was a thickness of 7 mm. In looking at many illustrations shown by the various writers on the subject since that time, one sees again and again this lack of uniformity.

Now given an optic nerve with only this slight protection one readily sees how an inflammatory process in an adjacent sinus may be directly transmitted to the nerve, or the pressure from the swelling in such a process may cause its constriction with temporary, if not permanent, blindness. Should this pressure be long continued, optic atrophy must result. According to Onodi's findings, transmission of the inflammation from the posterior ethmoid cells as well as from the sphenoidal sinus to the optic nerve is possible, as well as the pressure from circulatory disturbances. A periostitis in a sinus may lead directly to a perineuritis.

In an article read before the ophthalmological section of the American Medical Association at San Francisco last summer by Dr. H. H. Stack, 88 cases from the literature on this subject are tabulated, so the condition does not seem to be a very common, or at least not an easily discoverable, cause of blindness. Of the cases reported many show bilateral visual disturbances from unilateral accessory sinus disease.

For the origin and explanation of this contralateral and double-sided blindness with one-sided sinus disease Onodi gives the following 11 anatomic findings:—

1. The left posterior ethmoid cell constitutes the medial wall of the right canalis opticus.
2. The right posterior ethmoid cell constitutes the inferior and medial wall of the canalis opticus on both sides, and the wall of the entire sulcus opticus.
3. The right posterior ethmoid cell constitutes the wall of the entire sulcus opticus.
4. The right posterior ethmoid cell constitutes the wall of the right third and the middle third of the sulcus opticus.
5. The left sphenoidal sinus constitutes the inferior wall of the right canalis opticus.
6. The right sphenoidal sinus borders medially only the left optic nerve.
7. The left sphenoidal sinus constitutes the inferior wall of the right canalis opticus, and the wall of the right third and the middle third of the sulcus opticus.

* Read before the New England Otolaryngological and Laryngological Society at Boston, January 18, 1916.

8. The left sphenoidal sinus constitutes the inferior and medial wall of the canalis opticus on both sides and the wall of the entire sulcus opticus.

9. The right posterior ethmoid cell constitutes the larger part of the inferior and medial wall of the canalis opticus.

10. The left sphenoidal sinus constitutes the inferior and medial wall of the left canalis opticus, and the inferior wall of the right canalis opticus, also the wall of the entire sulcus opticus.

11. The right sphenoid sinus constitutes the wall of the middle third of the sulcus opticus.

In addition to the variations above described, there has been advanced a theory by Vossius to explain bilateral optic neuritis from unilateral accessory sinus disease. He says that "where the distance between the nerves near the intracranial opening of the optic canal is scarcely 1 cm., and this narrow space filled in by very loose tissue arising from the meninges, which is very well adapted to the spread of the inflammation, the disease can at this point spread immediately from one nerve to the other."

Normally, according to Loeb, "the optic nerve may be described as passing externally from the chiasm along the roof or lateral wall of the sphenoid and in close relation with the ethmoid labyrinth only at the posterior external angle of the last cell."

"Where this normal relation exists there is only the slightest possibility of any danger to the nerve in suppuration confined to the ethmoid cells," "But where the posterior ethmoid cell replaces a portion of the sphenoidal sinus, the optic nerve runs close to, and along the external wall of this ethmoid cell (as in two of the thirty specimens he studied) and its vulnerability is correspondingly heightened in view of the greatly increased portion exposed."

This relationship probably explains cases of optic neuritis without an accompanying sphenoiditis. The pathological findings in a majority of the cases make the diagnosis easy, yet in many the findings are slight, frequently only a thickened mucosa, as in my second case. The doubtful ones, then, where little or nothing can be found, call for special consideration. The findings on x-ray examination in these doubtful cases are rather disappointing. "X-ray photographs," says Hoeve, "although excellent diagnostic aids in accessory sinus diseases, give us by no means positive evidence. In the first place, all cases of sinus disease do not throw a shadow on the plate, and, second, as our information is usually obtained by comparing the two sides, in cases where one side is darker than the other, it is sometimes impossible to say whether only one side is affected or whether both sides are diseased, one side more than the other."

Loeb, however, reports an instructive case in which the radiograph showed both ethmoids obscured and in which, on operating, he found enough trouble to warrant his diagnosis of an

acute ethmoiditis just becoming purulent. His case was of five weeks' duration with increasing loss of vision for three weeks. One week after removal of both middle turbinates and cleaning out the ethmoid labyrinths the vision was about normal. In all cases I believe a radiograph should be made, for some abnormality might be found pointing, at least, to some vulnerable condition. The diagnosis in many cases is made largely from the visual disturbances. Blindness, in whole or part, comes on rather suddenly, as a rule. Most patients describe it as a "fogginess." The visual field is usually characteristic. The presence of a scotoma (from a Greek word meaning 'shadow') is the most definite and reliable sign of retrobulbar neuritis.

The increased pressure from the inflammation within the accessory sinuses causes a restriction of the visual field. At first the loss of vision is usually for colors, but if the case progresses, there may be eventually entire loss of sight. Enlargement of the blind spot or peripapillary scotoma is, according to Dr. J. van der Hoeve, of Utrecht, (among many other authorities) a most valuable and early symptom of optic neuritis from diseases of the posterior accessory sinuses.

DeKleyn investigated this symptom in 52 cases of posterior accessory sinus disease and found it present 47 times, while in a large number of cases with frontal or antrum disease he found the blind spot normal. In fact, the presence of an enlarged blind spot enabled DeKleyn in several cases to make a diagnosis of posterior accessory sinus disease which he verified by operation.

"Enlargement of the blind spot for white and colors points," says J. van der Hoeve, "with great probability to diseases of the posterior nasal accessory sinuses and justifies operative interference for this disease if there are no other causes for its presence." "Early treatment can cure the optic nerve affection."

The first case had so nearly lost her vision when first seen by Dr. Chandler that no visual field could be taken. The second case showed a scotoma for both form and color. Deep-seated pain is a frequent but not constant symptom.

CASE 1. Miss. R. S., age 23, a student, was sent to me by Dr. H. B. Chandler in April, 1911, for an examination of her accessory sinuses. She seemed in fair health. Had just recovered from an appendicectomy operation. Left eye nearly blind one year. Blindness came on gradually and was not affected by colds. Dr. Chandler reported the loss of vision to be due to chronic retrobulbar neuritis. The patient complained of violent left-sided pain of almost daily occurrence which seemed to be behind and below the eye and to extend nearly to the ear. She had some dropping in the throat; was not subject to colds. Had several attacks of hay fever. Nasal examination negative excepting for a white streak of secretion far back in the left side of the nose, apparently coming from the region of the sphenoid. This, with the pain and Dr. Chandler's report, seemed to warrant a diagnosis of probable

sphenoidal sinus disease, and I advised an exploratory operation. For various reasons this advice was not acted upon, and after seeing the patient three or four times and relieving the pain somewhat by local treatment, she was lost sight of for seven or eight months. Then she reported and said that, acting on the advice of her family physician, she went to one of our charity hospitals for treatment, but after being examined by many doctors and having several x-ray plates made, her sinuses were reported to be normal and nothing in an operative way was advised. The vision was unchanged. The headaches not so bad. I have not seen her since, but desiring to learn of the subsequent course of the case, I wrote her six weeks ago and her report is so complete that I give it exactly as written:—

"Winter of 1911-1912 spent in North Carolina. Sinus trouble improved; eye same. Vision in left eye blurred. Dr. Chandler examined in June 1912, said defect in sinus. Eye normal. Had tonsils removed.

"Winter of 1912-1913 went to Texas; high, dry climate. Sinus trouble cleared entirely. Eye remained about same.

"Summer of 1913. Boston. Old trouble returned. Eye seemed worse. Dr. Chandler again claimed eye normal.

"Returned to Texas, 1913-1914. Sinus trouble improved. No pus. No headaches. Eye remained about same. No pain.

"During summer of 1914 return of trouble while in Boston, and examination of eye showed gradual loss of sight. No sight in eye except of light and darkness.

"Winter of 1914-1915 in Texas. Bad rains, damp weather. Serious headaches. Return of pus discharge from left nostril. Specialist in El Paso said the eye was not affected by sinus trouble but that there was a defect in eyeball which had always been there.

"July 1, examined by Dr. W. L. Ballinger of Chicago. X-ray showed ethmoiditis.

"July 15, examined by Dr. Chandler, who still claimed a perfect eyeball, and said trouble all caused by sinus.

"Sept. 1 returned to Chicago and commenced serum treatment. Noticeable improvement from fourth injection of serum. Serum injected to the amount of 22 drops with serum reaction. For six weeks no flow of pus.

"Came to California for mild weather. Have had no headaches. No discharge of pus. Am feeling very well. The condition of the eye is the same. No improvement, the only sight is of light and darkness. Dr. Kyle of Los Angeles is continuing serum treatment for five more injections."

From the foregoing I think we may say that this patient probably had disease of the posterior ethmoid or sphenoid when first seen by me, and that this condition was responsible for her blindness. In the summer when she went to the hospital and was examined and x-rayed the trouble was quiescent, but recurred during the following winter, and thereafter as indicated in the patient's history of herself.

CASE 2. Mr. C. J. McC., age 25 years, postoffice clerk, was referred to me by Dr. W. J. Daly on

November 4, 1913. The patient seemed in good general health, habits good, did not drink or smoke. Urinary analysis negative; was not subject to colds or catarrhal trouble. Had no pain. His difficulty started with a "fogginess" in his left eye six days ago; vision now about 1/10. The right eye, also, for the past three days has had the "fogginess" so that he had to be led into the office. On referring this case to me, Dr. Daly said it was a case of retrobulbar neuritis and most urgent, as the patient would be hopelessly blind within a week unless relief could be immediately obtained. He reported that both fundi showed increased capillarity and blurred edges. The visual field showed a large central scotoma for white and colors.

After cocaineizing the nose, I was able to see the sphenoidal openings. The right sinus, as far as I could determine, was absolutely normal, while the only indications of a pathological condition in the left was a slight congestion about the opening. On probing, the right seemed of normal depth while the left was shallower, the probe entering it less than half the distance on the right. There was no pus present. The shallowness seemed to me to be a congenital condition, but I suggested an x-ray examination. The case was accordingly referred to Dr. Percy Brown, and his report is given in full as follows:—

"The patient is somewhat asymmetrical as to the anterior accessory sinuses of his nose, but I cannot therein find any appearance roentgenologically to account for his symptoms, in fact, the asymmetry observed here involves the right rather than the left side. Posteriorly, however, the patient presents a distinctly unusual appearance with reference to his sphenoid upon the left. The conformity of the sphenoidal sinus is distinctly unusual in that its cavity is, apparently, obliterated at a point which is usually but half the dimension (antero-posteriorly) of the normal sphenoid. In other words, that portion of the sphenoid which usually lies below the floor of the sella is here completely occluded. Whether or not this occlusion is produced by infiltration or whether it is merely the relative occlusion of an anatomical anomaly, it is hard to say, but I should be inclined to think that a sphenoid so unusual in its contour, and thus so confined to its extent, would be easily the locus for infiltration, inflammatory or otherwise.

"I see no evidence of a neoplastic nature to account for the above sphenoidal condition. The sella itself measures in both diameters about as normally seen. Its floor is thin, and, as I have said, is superimposed upon that portion of the sphenoid which is apparently occluded. Its posterior clinoid processes are pronounced, possibly, to an extent which might impinge upon an otherwise normal hypophysis, but I am not inclined to lay much stress upon such a possibility here. The posterior ethmoidal cells are relatively clear, so far as I can see."

On receiving this report, I at once opened the patient's left sphenoid. The operation required about one-half hour and consisted in the removal of the lower posterior portion of the middle turbinate, after which the anterior wall of the sinus was removed with a curette and punch forceps. Within the sphenoid there was neither pus nor granulation tissue. The only abnormality was a slight boggi-ness of the mucosa and the shallowness.

The post-operative treatment consisted in the daily douching of the sinus through a long silver cannula with a hot alkaline solution.

Dr. Brown has made three examinations since the operation, endeavoring to determine if there was any change in this antero-posterior diameter. His second report is as follows:—

"The roentgenological situation in the case of the patient at the time of my second examination still, of course, has as its basis the appearances seen at the first examination, with especial reference to the sphenoidal sinus. The partition subdividing the sphenoid, however, seems not to be so strongly marked as it was at the first examination."

Twenty-four hours after the operation the vision commenced to improve. The "fogginess" about which the patient complained he reported as lessening. When I was operating on him he said in regard to his vision that he could not see his baby's face,—face and form were a blur. Dr. Daly made almost daily examinations of his vision and his recovery was steady and rapid.

Before taking one of the last radiographs, I put a probe into the left sphenoid, and, on looking at the plate, thought it must have slipped out as there seemed to be a good-sized sinus beyond it. On examining the sinus a few days ago, I bent my cotton stick and was able to pass it external to and over the back wall. This shallowness thus seems to be due to a very unusual twist in the sphenoidal septum. Then I probed the right sinus again and found that its depth corresponded to that on the left found by bending the cotton stick around this crooked septum.

The interesting points in the case seem to be as follows:—

1. Only one sinus was affected while both eyes showed the neuritis.
2. The findings on examination of the sinus were slight compared with the seriousness of the inflammatory process.
3. The question as to whether the shallowness was congenital or pathological.
4. The rapidity with which the vision returned.

The point I wish to emphasize in this paper is the insignificance of the findings in many of these cases and the necessity for prompt interference. That these views may not seem too personal and to be derived from a very limited experience, I wish to cite the conclusion of Drs. Smith and Onodi.

"In my opinion," says Dr Harmon Smith (in an article written in 1911), "it is unquestionably a justifiable procedure to operate on these sinuses when every other possible cause of the neuritis has been eliminated. Even where there is no local or intranasal evidence of the existence of an empyema, such interference may be justified as an exploratory operation, and, when performed by one familiar with the anatomy, it is without material danger to the patient. The mere depletion incident to such an operation will in itself prove of value if the neuritis is due to the pressure of a diffuse inflammation."

"I must emphasize," says Onodi, "this fact:

that in those cases of sight derangements in which the oculist cannot confirm the cause and the suspicion of nasal connection exists even though the findings be negative, it seems best to take explorative measures, and to seek the cause in the accessory sinuses, whether or not the presence of latent foci is suspected."

The excellent results following operation in many of the cases reported where the findings were almost nil have amply confirmed these statements.

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Reports of Societies.

BOSTON SURGICAL SOCIETY (INCORPORATED).

MEETING No. 9.

A STATED meeting was held on Monday, January 3, 1916, at the Harvard Club of Boston.

The first paper of the evening was read by Dr. F. J. COTTON, on "The Disinfection of Septic Joints."*

DISCUSSION OF DR. COTTON'S PAPER.

DR. PORTER said that he had been much impressed with the inadequacy of drainage of joints, particularly of the knee joint. By examination of the specimen after amputation, it was evident that a stagnant pool of joint fluid and exudate remained in the deeper portion of the joint, and that below the level of this fluid caries of the cartilage and of the bone went on, even though the drier portions of the joint were free from disease. He advised obtaining complete drainage in severe suppurative cases by division of the patella tendon, or by low lateral incision over the condyles. He also advised the use of rubber dam in preference to tubes for drainage. In very bad aureus infections he would use temporary drainage; in less severe cases he believed the irrigation method of Dr. Cotton was satisfactory.

* See JOURNAL, page 779.

DR. PORTER stated that in one infected knee-joint he had used injections of ether in the joint cavity, but was unable to state the end result.

DR. SCUDDER stated that he felt it was a complicated problem, and that one must consider the systemic as well as the local condition in a given case. In some cases he felt that the systemic condition demanded radical treatment of the joint, as a life-saving measure, and that function in these cases was a secondary consideration. In such cases he believed that effective drainage of the joint was the principal object to be attained.

DR. LOVETT called attention to the very virulent forms of acute arthritis in very young children, and believed that no palliative treatment would probably be effective in such cases.

DR. LINCOLN DAVIS reported six cases of infected knee-joint operated on at the Massachusetts General Hospital, and several at the Eye and Ear Infirmary. In only one case was there a good functional result. The results obtained by the usual methods were very poor. Amputations were frequently necessary.

Under these circumstances he thought we should welcome Dr. Cotton's method and give it a thorough trial, although theoretically one might doubt the efficacy of disinfection obtained by using 1-15,000 corrosive sublimate solution.

DR. PACKARD stated that formerly he used drainage and joints did badly, but later he had restricted his treatment to aspiration and instillations of iodoform, and that he believed this to be the better treatment.

DR. BOTTOMLEY agreed with Dr. Porter in feeling that the location of our incisions for the drainage of infected knee-joints was often faulty and consequently ineffective. While this fact might explain some of the bad results that follow our present methods of treatment, yet it did not explain them all, and he was ready to adopt Dr. Cotton's suggestions, even though skeptical of the real efficiency of disinfection.

DR. BOTTOMLEY asked Dr. Cotton if the latter made a point of keeping the joint surfaces apart by extension applied immediately (as used by Dr. J. B. Murphy), or if Dr. Cotton used any particular form of temporary fixation of the joint in addition to the other measures employed by him.

DR. OSGOOD called attention to the fact that the conservative method advised had been advocated fifteen years before, by Goldthwait, for acute gonorrheal joints, using an irrigation of hot salt solution at 112°. He advocated this treatment at first, and more radical drainage if the further progress of the case demanded.

In closing the discussion, DR. COTTON made the following suggestions:

- 1:15,000 corrosive solution, he believed, was effective in retarding the growth of cocci, even if it did not kill. Resistance of the joints he believed to be an important factor.

2. A very important factor of the method of treatment was that the incision should be efficient and that the irrigation should continue for at least fifteen minutes with a hot, strong stream, allowing the joint to distend and collapse. The corrosive solution was then to be washed out with salt solution, the edges of the capsule brought in close approximation in two layers, and the skin wound left open, as suppuration always took place in the areolar tissue.

3. Dr. Cotton admitted that none of the cases he reported were of the peracute type, but maintained that most of them showed severe constitutional symptoms. He called attention to the fact that one case died of meningitis after the knee-joint had been so treated, but at autopsy the joint appeared to be free from infection.

4. Dr. Cotton advised the use of the irrigation method first in any given case, but recommended a good free drainage if the irrigation method failed.

5. He pointed out that some joints, like the hip, because of the lack of a distensible capsule, were not suited to this method of treatment.

6. In his experience extension in after-treatment was often unnecessary. He had been surprised at the freedom from spasm and from pain in these joints after irrigation.

7. Dr. Cotton used campho-phenol (49.5% carbolic) in certain open drained cases as an instillation. This is a non-corrosive, non-poisonous, phenol disinfectant. He further pointed out that all of the cases that he had reported were cases of hematogenous infection, and that recovery after even efficient drainage almost invariably implied ankylosis.

DR. H. CABOT and DR. E. GRANVILLE CRABTREE read a paper on "A Classification of Renal Infection, with Particular Reference to Treatment."*

DISCUSSION OF DR. CABOT AND DR. CRABTREE'S PAPER.

DR. E. GRANVILLE CRABTREE spoke briefly of the laboratory work which he had done, and the data on which the conclusions of Dr. Cabot were based. He spoke first of the fact that in early cases of renal infection, before the urine contained pus, with the centrifuge it was possible to show the presence of cocci. He then instanced examples in which old cultures of the colon bacillus and attenuated cultures of para-typhoid injected in the blood could be recovered from the urine of the rabbit within forty-eight hours. He called attention to the excretory function of the kidney as shown by the passage of tubercle bacilli through the kidney, and their recovery in the urine in pulmonary tuberculosis without gross kidney lesions. He then stated that there was a certain amount of evidence in support of the hematogenous origin in some of the infections heretofore supposed to be most typical of the "ascending" type, as, for instance, in a freshly infected pyelonephritis.

DR. JONES called attention to the fact that the occurrence of perinephric abscess as a unilateral infection would appear to be contrary to the supposition of a hematogenous infection. Yet he has pointed out for a number of years that the evidence is in favor of the theory that all perinephric abscesses, except those due to tuberculosis, and infections of the pelvis, are owing to hematogenous infections of the kidney. The finding of abscess cavities in the cortex of the kidney at operation, and the localization of the abscess immediately about the kidney for a long period, are in favor of this theory. In looking up the cases of perinephric abscess at the Massachusetts General Hospital a few years ago, the average duration of symptoms before operation was about eight weeks. If the infection took place in the perinephric fat the pus would not remain localized in the flank for any such period.

* See JOURNAL, page 780.

DR. PORTER believed that in the early days nephrectomy had been performed too frequently for hematogenous infections of the kidney, and that many of these kidneys would have been of value if they had been preserved.

DR. J. HOMER WRIGHT stated that in general he agreed with the suggestions of Dr. Cabot's paper—namely, that the coccus infections and the colon bacillus infections of the kidney produced a different pathology, the cocci producing a suppurative hematogenous infection in the glomeruli, while the colon bacilli produced infection in the tubules, with extension to the pelvis. He believed that further investigation was necessary on the question of whether glomerular abscesses were ever produced by the colon bacilli.

DR. CABOT closed the discussion. He stated that it was his belief that the resistance of the kidney played a part quite as important as the original infection, and that it was to this fact that the varying severity of the infections could be attributed, together with the occurrence of unilateral instead of bilateral disease. He stated that he believed there was evidence in the lowered output of phthalein during the latter months of pregnancy, indicative of renal damage, and, perhaps, explanatory of the frequent occurrence of infection at this time.

ROBERT B. GREENOUGH, *Secretary*.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

MEETING OF WEDNESDAY, NOV. 3, 1915, AT 8 P.M.

The President, DR. JAMES C. WILSON, in the Chair.

SOME PHYSICAL FACTS ABOUT THE RADIO-ACTIVE ELEMENTS AS APPLIED IN MEDICINE.

DR. WILLIAM S. NEWCOMET: The object of this paper is to present a few of the more common misconceptions concerning the radio-active elements. It is unfortunate that the supply of radium is so scattered as it is. This institution could accomplish much for mankind if it could centralize or develop an institution where radium and its allied elements could be obtained and employed strictly for what they are worth, divorced entirely from all tendency to explanation. Just so long as radium remains in the hands of private institutions, or worse still, in private hands, just so long will its usefulness be impaired. The use of these elements must be divided into two groups: (1) For the purpose of irradiation; (2) for employment as medicine internally. In its local use the principal and most penetrating ray of radium is the x-ray, analogous to the Roentgen rays. A second ray, known as the B-ray is analogous to the cathode ray; a third, the alpha ray, is practically worthless in external applications, although 90% of the energy of these radio-active elements is of this form. It must be remembered that radium is merely the parent and gives forth the elements giving rise to the "active deposit." While the rays of thorium are still more penetrating than those of radium, its use must be

confined to the applicator method, and its manipulation from a chemical standpoint is difficult. We should have established in our midst laboratories where these preparations could be obtained and measurements made as occasion demanded. An instance illustrating such need is that of a dealer in this city who had for sale two tubes of radium. He stated that they had originally been purchased from a well-known chemical house, the price being \$400 to \$1400. The value of the radium was found to be 40 cents and \$30. While the external use of radium has many pitfalls, the internal employment has many more. There seems to be a confusion between the so-called rays that emanate from the different radium elements and the emanation which is an element and a gas,—subject to all the laws of other gases, and which when confined within a tube cannot escape.

In the internal administration of radium or thorium it should be remembered that it is the radio-activity and not the elementary base which affects the system. Radium may be given as a salt, soluble or insoluble; or it may enter the system as a gas in the form of the emanation. The salts give off the emanation in proportion to their age, continuously in a definite ratio as long as they are contained in the system. It must be remembered, however, that insoluble salts allow only about 2% of the emanation to escape. Radium may be obtained in solution, its strength and dosage estimated. Just what effect the sulphates of the body have upon it is not definitely known. While in the body, it is giving forth its activity, changing slowly into the emanation, the emanation in turn to the "active product." Should an insoluble salt be administered it passes along the alimentary canal unabsorbed, but gives off the emanation and active product, which are absorbed. The major portion of this emanation, however, remains occluded within the intermolecular spaces of the insoluble powder, and its effects continue until it is eliminated. Although given in solution, water containing emanation must be used at its source. When this is not possible, the commercial emanation, which, however, is not very efficient, should be used under the best conditions.

Attention is also called to the conditions in the use of thorium salts. The desirable product for the internal administration of thorium is thorium-x. It has about the same period of life as radium emanation. Since it is a salt instead of a gas, it remains within the system, undergoing a very rapid change to emanation and "active product," and is, therefore, more powerful than the radium product. The therapeutic value of these extremely powerful agents has by no means yet been established, yet they are being employed by persons with little comprehension of their effects. Beyond doubt they are of value, but the results in their use are in proportion to the skill with which they are administered.

DISCUSSION.

DR. SOLOMON SOLIS COHEN: In estimating the value of any method of treatment which is to a certain extent new or unfamiliar, there are certain difficulties. One arises from the extravagant statements of those who use it without much thought of what is to be expected and without much ability to criticize results. Another, equally unfounded, arises from the skepticism of those who have made no use of the method, but deny its value *a priori*. But the

greatest difficulty of all, I think, arises from its use, even by intelligent persons, with extravagant expectations of what is to be accomplished. Failing to realize such expectations, the method is condemned as valueless. I have seen no convincing explanation of the therapeutic effect of radium emanation water, but we know that in some pathologic conditions, certain definite changes may reasonably be expected to follow, although not in every case. In my early experience with radium emanation water in a few cases of arteriosclerosis and in a few cases of high tension from other causes, in which it was used, a marked lowering of blood pressure was observed. In other cases exactly similar in every respect, so far as I could tell, this effect was not produced. I have found three forms of the radium emanation apparatus trustworthy. One is made in Pittsburgh, one in New York City, and the other is imported. In selected cases of a limited number of affections, chiefly of the joints, and of certain metabolic aberrations, we do with this agent get reasonably good results in an uncertain proportion of cases,—and that is all we can expect. In one case of long standing osteo-arthritis of the spinal column and in a number of cases of arthritis deformans of the extremities I have seen better palliative results than I know how to obtain by other means; also in a number of gouty patients there has been considerable amelioration. I have seen no case of arthritis deformans or of any other chronic affection of the joints, or gout, or chronic metabolic disturbance cured by means of radium emanation water. We must remember that we have in radium emanation water an agent of limited power, which must be used with discretion and intelligent appreciation of the laws underlying its action.

DR. A. B. HIRSH: I wish to ask Dr. Newcomet his opinion of the intravenous injection of radium as recommended by some commercial concerns sending out so-called literature. A recent issue of the American Medical Association contained a caution on this mode of administration because of our lack of knowledge of the end action in the economy of radium when administered in this form.

DR. NEWCOMET, closing: I did not attempt to speak upon the physics of radium. This subject was presented to us a year or two ago by Dr. Goodspeed, and at that time the different methods of measurements were given. I desired to call attention, as Dr. Cohen has emphasized, to a number of mistakes made in the use of radium preparations, and especially to emphasize the desirability of establishing a central station for supply, so that every physician might obtain radium, thorium, or other agent, in desired amounts, and possessing therapeutic activity. Regarding the question of the intravenous injection of these salts, I mentioned that we have the soluble and insoluble salts of radium and the gas,—the emanation. It must be remembered that radium sulphate is the most insoluble salt known. Just what effect the sulphur and sulphur acids in our economy have upon radium combined with these products of disintegration, such as the emanation, "active deposit," is still unknown. Certainly they must be given with judgment. I think this answers Dr. Hirsh's question.

THE OCCURRENCE OF MILIARY TUBERCULOSIS OF THE LIVER IN THE COURSE OF PULMONARY TUBERCULOSIS.

DR. ROBERT G. TORREY: The paper is based upon a study of the reports of 132 autopsies on subjects

showing pulmonary tuberculosis. The frequency with which an apparently recent and wide-spread miliary tuberculosis of the liver is found at autopsy in cases of pulmonary tuberculosis, and the finding that in cases of phthisis dying from other causes, as fatal hemorrhage, acute peritonitis, septicemia, lobar pneumonia, etc., miliary tuberculosis of the liver is not found, makes it appear that the hepatic involvement may be an important factor in determining the fatal issue. The author thinks it probable that infection of the liver frequently takes place by way of the spleen, where the tubercles are of varying age and lie in close relation to large blood spaces directly connected with the portal vein.

DISCUSSION.

DR. ALLEN J. SMITH: I have been particularly interested in this curious anomaly of the appearance of tubercles in the liver in individuals apparently dying from pulmonary disease, while in other cases in which there was pulmonary disease, but in which death occurred from other causes, these tubercles were not present. I agree with the suggestion of Dr. Torrey that there may have been a direct transference of the infection by way of the arterial system. That the liver has a high resisting power is clear from the fact of its frequent exemption from tuberculosis, and that if attacked, dissemination of the disease is rare. Only in experimental work in the lower animals, in which the resisting power is low, are we apt to find wide dissemination. If we regard the dissemination due to lowered resistance of the liver, we should expect to see loss of its functional power. It is unfortunate that we have not some better test than at present to determine whether or not there is alteration in the metabolic function of this organ.

DR. WILLIAM M. L. COPLIN: I recall two cases of tuberculosis of the liver manifesting unusual features. One was that of a girl of fourteen years of age, who at operation showed extensive miliary tuberculosis of the peritoneum with voluminous ascites. The serosa was studded with grey tubercles. Nodules were present which macroscopically appeared to be composed of tubercles within the liver. Upon excision of a fragment, intrahepatic tubercles and contained bacilli were demonstrated. The patient recovered from the tuberculous peritonitis and from the lesion in the liver and has married and borne children. In the other case, the liver contained tubercles clearly of different ages; one group had apparently developed shortly before death. I have not found the so-called sub-miliary tubercle of the French writers so frequently as it is said to occur. Of special interest is the relation of lipoids to immunity and especially to the immunity of tuberculosis. It may be that in certain extremely fatty livers frequently found in patients in whom all conditions appear favorable for the development of hepatic tuberculosis, the liver escapes because of the intracellular lipoids. I do not recall an instance of intense miliary tuberculosis in a very fatty liver.

CREeping ERUPTION OF THE SKIN, WITH HISTOLOGICAL EXAMINATION AND THE DEMONSTRATION OF THE BURROWS AND THE LARVAE IN THE EPIDERMIS.

DR. FRANK CROZER KNOWLES: A short review is given of the general subject of creeping eruption, and reference made to the fact that the histological

examination has been successful in but three cases, including the one here reported. The paper is based upon the study during the last three years of 3000 serial sections from the present case. Quite a number of stains have been employed in order to bring out the various salient features of the eruption. The investigation has been most successful in that fully 150 sections show excellent views of the burrows and that 30 present various portions of the larvae. This is the first time that the larvae causing creeping eruption have been found in sections, and also the first time that a successful histological examination has been made in America. The paper is illustrated by lantern slides, in which three clinical pictures are shown of the case, four illustrations of the burrows, three drawings of the larvae in sections, and a photograph of magnified skin showing the clinical appearance of the burrows. In comparison photographs are exhibited of the burrow caused by the itch mite, the *acarus scabiei* and ova in sections, the burrows of creeping eruption from the case of Rille's and Riecke's, and Sokolow's drawing of the larva. It is a notable fact that while the burrow of scabies is found in the middle and upper horny layer, that produced by the larva in creeping eruption is found in the lower horny layer at the junction with the rete and also in the upper portion of the latter epidermic layer. Some of the burrows were without contents, but the majority were either partly or entirely filled with granular debris, degenerated epithelial cells, free nuclei, eosinophiles, polymorphonuclear cells and lymphocytes. A complete histological examination has been carried out in reference to all of the various layers and structures of the skin. The classification, incubation period, and mode of infection of the individual by the larva are also discussed.

CLINICAL CONFERENCE OF THE NEUROLOGICAL INSTITUTE, NEW YORK.

REGULAR MEETING, FEBRUARY 1, 1916.

J. RAMSAY HUNT, M.D., in the Chair.

A CASE OF DYSSYNERGIA CEREBELLARIS PROGRESSIVA.

DR. J. W. STEPHENSON presented from the Second Division a woman aged 31, Austrian, married, with three children, one born in 1910 and twins in 1912. Both deliveries were difficult. The patient had been under observation in the clinic for one year. Her story was that in 1908, one year prior to marriage, she began to have shaking of the left upper extremity, which was soon followed by shaking of the left lower extremity. These two symptoms gradually progressed in severity, but at times there were periods of short remissions. However, in these remissions the "shaking" did not entirely disappear. In 1914 her head began to shake, and this also followed the course as portrayed in the extremities. Three months before entering the hospital she experienced a few days of urinary precipitancy and questionable incontinence. As stated, the case had been constantly under observation for one year, and whereas there was a slow but progressive increase of the shaking, the physical findings have remained identical, which were as follows:

All the deep reflexes were present and a little active. The plantar responses were flexor. The abdominal and epigastrics were present and equal, the eye mobility was normal as was the light and accommodation reaction; never any nystagmus. Repeated fundi examinations have been negative, nor has there ever been elicited any history of diplopia. There were no sensory changes. The only abnormal finding was the "shaking" or tremor. In attempts at locomotion the patient's gait was not unlike Huntington's chorea, but the explosive voice, etc., were absent. Volitional effort of any kind produced a marked exaggeration of the tremor. The tremor itself, whereas it simulated exaggerated choreiform movements, was most closely allied to the intention tremor of multiple sclerosis. There was a constant rotary tremor of the head. There was a curious irregular dysmetric movement of neck and shoulders, apparently voluntary effort to counteract the dysmetria. On attempting the finger nose test there was produced a coarse, markedly exaggerated tremor of the intention type: the patient, only after prolonged effort, being able to perform the act, and with fingers resting on nose there was a constant tremor of the hand and extremity. When in repose all tremors ceased, except a slight shaking of the head. Immediately on speaking to the patient, the tremor reappeared. Any attempt to perform any particular act, be it however small, greatly intensified it. During sleep there was no tremor.

The question of diagnosis was interesting in that the condition simulated so many long-recognized entities. The gait suggested Huntington's chorea, but there was no speech disturbance, nor were the movements choreiform. The absence of these symptoms eliminated this diagnosis.

It was stated that at the first visit to the Clinic, one year ago, patient was psychoanalyzed, inasmuch as the movements suggested a tic or a psychogenic condition, but this analysis proved of no avail, and suggestive therapy gave no relief. Parkinson's disease was considered, but the age, absence of the masked expression, the fact that the tremor was not the fine rhythmic tremor of that disease, but a coarse intention tremor, much exaggerated by intentional acts and disappearing on repose, eliminated this condition.

Dr. Stephenson considered this condition as one most nearly approximating multiple sclerosis, but that the patient had been observed for one year with that diagnosis as a secondary consideration, and during this time had never developed a nystagmus or diplopia. The fundi had never shown any suggestion of pallor. The abdominals were constantly present and the plantar responses always flexor. Central scotomata were never elicited. From the fact that not one of these cardinal symptoms could ever be obtained, it was concluded that multiple sclerosis could be eliminated. That the tremor was of the intention variety it was agreed. The patient presented only one symptom, viz., tremor. This tremor being intention and not choreiform, Dr. Stephenson placed the lesion in the cerebellar mechanism, probably degenerative, and considered the case analogous to the affection, originally described by Dr. J. Ramsay Hunt as dyssynergia cerebellaris progressiva, or progressive cerebellar tremor. (*Brain*, 1914, xxxvii, p. 247.)

A CASE OF INTERCOSTAL NEURALGIA WITH UNUSUALLY SEVERE HYPERESTHESIA, SHOWING COMPLETE RELIEF FOLLOWING POSTERIOR ROOT SECTION.

The following case was presented by Dr. E. L. ROCHFORD from the Third Division: The patient, a Frenchman, 61 years of age and a bronze worker for 30 years, came to the Clinic here in February, 1916. His family history was negative. He gave a history of syphilis 41 years ago in France, where he received a thorough course of treatment. He has had a chronic cough and expectoration about five years and has been told by several physicians that he had tuberculosis. Alcohol and tobacco he has used moderately. His wife has had hemiplegia for the last 25 years and has never been pregnant. The onset of his present illness was about two years ago, with severe pain in the lower dorsal region, that was diagnosed as lumbago. The pain became very acute and he went to a hospital, where his back and left side were tightly strapped. The straps were left on several days, and when removed the patient states many blisters were found below and most of the skin beneath the adhesive peeled off. This did not relieve the pain, and as soon as the skin had healed he noted the condition from which he has suffered up to the time of his admission to the hospital, *i.e.* a constant dull pain over the area supplied by his 5th-6th-7th dorsal nerves, and a most acute hyperesthesia of this area. He has sought relief in several institutions but nothing has given him relief. On many occasions he has been given morphine to quiet his pain, which has prevented his working except at intervals, when for financial reasons he found it imperative.

At Mt. Sinai Hospital, in May, 1915, it was found he had an aortitis, and a section of a slowly developing growth that extended over his pharynx was removed. This, on pathological examination, proved to be a flat-celled epithelioma. Repeated x-rays of his spine at various hospitals have all been negative. The pain has been so constant and severe as to cause the patient to contemplate suicide, which he claims he would have done long ago if it had not been for his wife. When first seen at this hospital it was thought that his condition was partly of an hysterical nature. Further and more careful examination, however, proved conclusively that this assumption was entirely unjustified.

His physical examination was as follows: A fairly well developed but poorly nourished man with a slight kyphosis in the upper dorsal region (probably occupational). Eyes, negative except for rather sluggish response to light. Teeth fair. On posterior pharyngeal wall is seen a low, flat reddish growth extending over the posterior surface of the tonsils and to the lower border of the pharynx. It was not elevated and did not bleed on being irritated. There were no enlarged glands in the vicinity and the growth did not appear malignant. (The patient stated he had known of its presence for several years but it had never given him any trouble.) There were a few fine moist râles over both lung apices. The heart sounds were roughened but there were no distinct murmurs. His abdomen was negative. His radials moderately sclerotic. S.B.P. 150.

Under his left arm pit, extending down the chest wall about 4 inches and posteriorly to about 3 inches from the midline is a reddened area, covered with smooth skin (where the skin was pulled off with adhesive). About this area were several small

scars suggestive of herpetic lesions. These were more numerous over the anterior surface.

Over the sensory distribution of the 5th, 6th and 7th dorsal nerves several distinct changes were demonstrable. The most remarkable of these was the most exquisite hyperesthesia. When touched lightly with cotton the man would wince and groan with pain. The same area might be pinched hard enough to cause acute pain in a normal person, without the man complaining. There was also a moderate degree of hyperalgasia over this area, to the pin scratch and pin prick. To thermic stimuli there was a slight hyperesthesia to both heat and cold. The patient had noted that firm pressure over this area has given him some slight relief from pain, and when he walked about he usually kept his right hand pressed tightly over the region. The remainder of his physical examination was negative. His blood, urine and cerebrospinal fluid examinations at this hospital were entirely negative.

On March 15, 1916, a posterior root section was performed by Dr. Elsberg. The spines and laminae of D 7-8-9 were removed and about 1 cm. of D 5-6-7 posterior roots were resected on the left side. The wound was closed in the usual manner and the patient made an uneventful operative recovery. Since the operation the patient has been entirely free from pain on the left side of his chest, and palpation over the previously sensitive area shows that the hypersensitiveness has totally disappeared. Examination two weeks post-operative shows slight hyperesthesia to cotton wool and a slight hyperalgasia to pin scratch and pin prick. To heat and cold the hyperesthesia is about as it was before operation. The patient is now feeling better than he has for several years and will soon resume his work.

As to the etiology of his condition, there is still considerable doubt. It was most probably a post-herpetic affair. It is of interest to note that Oppenheim and others have reported several similar cases in men who worked in lead and arsenic. The patient as a bronze worker was brought in contact with both these metals for a long period. The possibility of a vascular condition following his specific infection is a strong one. Against this, however, are his repeatedly negative laboratory findings. It was not thought that the apparently benign growth in his pharynx had any bearing on the condition. At any rate, the man is now entirely relieved and there is no reason to anticipate a recurrence of the trouble.

A CASE OF CARDIORENAL DISEASE SIMULATING BRAIN TUMOR.

DR. C. BURNS CRAIG presented from the First Division a patient, a watchmaker, 42 years of age, who complained of increasingly severe headaches, limited chiefly to the temples, but involving the entire calvarium, increasing deafness and failing vision; also vomiting attacks, and periods of respiratory difficulty. The patient dates the onset of his trouble, June, 1915, and states that his condition has become steadily worse since then, especially the headache and failing vision. He denies syphilis and his Wassermann is negative. He sustained two head injuries; twenty years ago he was sandbagged and nineteen years ago he was kicked in the head by a horse. He was formerly a constant and excessive drinker, but has taken no liquor for the past sixteen weeks. Formerly he often consumed as many as 15 or 20 cigars daily, but takes none now. In childhood he suffered from whooping cough, measles

and had malaria at the age of 14. His father died at the age of 54, of cirrhosis of the liver.

Upon a more careful inquiry as to the onset of his symptoms, it turns out that for the past ten years he has had headaches, but that it is only in the past six months that they have become unbearable at times. He makes his failure of vision cover about the same period, but marked disability has existed for only two weeks. He had had vomiting attacks as much as ten years ago, but these probably followed drinking bouts. For the past two or three days nothing has been kept in his stomach, even water he would vomit. The defect in hearing goes back as far as thirty years, when he had suppurating middle ears. Following this the right ear was almost deaf, while the hearing in the left ear has been impaired for only the past ten years. During the past ten days his heart did not seem to beat fast enough and he got short of breath and more or less of a feeling of panic. His mother has noticed that he has been mentally confused for the past two weeks, that he imagines things. During certain periods of his terrific headaches, he thought grotesque animals were crawling on the wall. Upon examination he is seen to be a vigorous physical man, perhaps a little over-nourished, without atrophy or skeletal defects. There is rather a vacant expression upon the face and a continued stare in the eyes. The sides of the mouth show an apparent weakness when at rest, which disappears when activated or under emotion. There is a slight tremor of the hands and of the protruded tongue. The tendon and skin reflexes are all present, and symmetrically equal. No Babinski, no Hoffman sign, no clonus. No lack of skill in the use of the fingers. The left border of the heart is perhaps a centimeter outside the nipple line. Pulse rate is 84; there are no murmurs, but the systolic blood pressure ranges from 210 to 230 mm. of mercury. There is a slight swaying in the Romberg position and at times he seems to tend to fall towards the right. His gait is normal. Ocular movements are well preserved. Pupils are large, left slightly greater than the right and both are rather sluggish to light, and of limited excursion. Dr. Ward Holden reports his vision 20/20 in the right eye, and 20/30 in the left, with field complete. Disc margins are blurred, the veins tortuous, with about 1 m.m. elevation of the nerve heads. Dr. Dench finds no evidence of intracranial involvement of the auditory apparatus, but concludes that the defect in hearing is due to his old middle ear suppuration. His speech shows a mild dysarthria, stumbling over test phrases, but this disability he says dates from childhood. Examination of urine shows numerous hyalin and granular casts with albuminuria, an excess of indican, acid reaction and specific gravity 1024 c.c.

We have, therefore a case presenting many of the cardinal symptoms of intracranial neoplasm, namely, headaches, failing vision due to papilledema, deafness, vomiting, respiratory disturbance, hallucinations, and altered mentality. When analyzed and each symptom carefully accounted for, we are forced to the conclusion that the condition is the result of cardiorenal system.

In connection with this case, Dr. Craig presented three other cases having pathological conditions in the ocular fundi: One a primary optic atrophy of unknown origin, possibly nicotine; another, atrophy occurring in tabes; and a third showing the tem-

poral pallor frequently seen in disseminated sclerosis.

Harvard Medical School.

HARVARD MEDICAL SOCIETY.

HISTORICAL CLUB MEETING IN THE PETER BENT BRIGHAM AMPHITHEATRE, TUESDAY EVENING, MAY 2ND, AT 8.15 O'CLOCK.

Paper of DR. FRANCIS G. BENEDICT:

IVAN PAWLOW; THE MAN AND HIS WORK.

THIS talk has rather an unusual significance since the cause of it was the report of the death of Prof. Pawlow, and this as yet, I am glad to say, has remained uncertified. Repeated inquiries made at the Russian Embassy in Washington have failed in determining whether it was the court surgeon, E. W. Pawlow, or our own Ivan Pawlow, the physiologist, who succumbed.

Prof. Pawlow was undoubtedly the best known Russian physiologist. In many ways he was the best known Russian scientist. It was about ten years ago that he was awarded the Nobel Prize. His contributions, which are very numerous, were in so many different fields that it appears as though he had touched most branches of science.

Pawlow was born in 1849. His father was a priest. Throughout his school years his life was uneventful. He attended the St. Petersburg Military Medical Academy and in 1883 received the degree of doctor of medicine. He attained his first important scholastic position when he became professor of pharmacology. It was not until he was 41 years of age, however, that he was enabled to work at one line of investigation permanently. His earlier studies were carried out under the most unfavorable conditions. He worked from hand to mouth, having scarcely a corner which he could call his own. During this period he was actually forced to care for his experimental animals in his own home. This intimate relationship between the investigator and his animals may explain, in part, the remarkable results which he obtained, for his post-operative treatment was fully as wonderful as his operative technique.

After being graduated as a doctor of medicine, Pawlow studied abroad for two years. He was first with Heidenhain and later with Ludwig. In Ludwig's laboratory, particularly, he was severely handicapped by his unfamiliarity with the German language. He nevertheless made minor contributions during this period. Upon returning to St. Petersburg, he became professor of physiology in the Military Medical School.

Ultimately he became the director of three laboratories in St. Petersburg: the Institute of Experimental Medicine, The Military Medical Academy and the Academy of Sciences. These he visited each day, and, though they were situated at a considerable distance from each other, he invariably covered the ground on foot.

My personal relationship with Ivan Pawlow began eight years ago. I met him on a number of occasions both in his home and at his laboratories. My first impression was that of a man of lightning-

like vigoroussness. He seemed to be in continuous motion. In this country he probably would have been characterized as a "real live wire." While watching him at work, a visitor once remarked that he had the eye of a hawk and a hand of steel, coupled with marvellous speed.

His quarters, when I visited him, were not sumptuous, but they were equal to his needs. His needs, however, grew rapidly as the years passed and they have been met recently only by the completion of additional laboratories.

His work may be divided into three main parts. From 1879 to 1887 he made rather important contributions to the physiology of the circulation. The real merit of this work, however, has scarcely been appreciated since the papers were all published in Russian. It is practically a ruling of the Russian government that any works carried out under imperial subsidy must be published in the mother-tongue.

The second part of his investigations concerns the physiology of the digestive tract. This work was started back in 1879 before he had been graduated from the medical school. He wrote one or two papers on digestion and demonstrated a method for making a gastric fistula before the military medical academy. Later papers on digestion appeared in rapid succession. These were likewise printed in Russian and consequently received only scanty attention. It was not until 1897 that his book on the digestive tract really brought him to the attention of the public in general.

The third part of his professional work had to do with animal psychology. As the contributions from this source have also been published in Russian we have only a fragmentary knowledge of the scope and significance of these later studies. The experimental demonstrations on the psychology of reflexes are nothing short of marvellous. Stimuli which at first are painful, through association with food, for example, may subsequently arouse only pleasurable sensations. After Sherrington had seen these reactions he exclaimed, "Now I can understand the Christian martyrs."

(Slides of Pawlow's home and laboratories were shown.)

As a professor in the Military Medical Academy, Pawlow was entitled to wear a military uniform. This he would never consent to do, however, though he was requested on many occasions to sit in military regalia for a photograph.

The antivivisection society has endeavored through its bulletins to convey the impression that Pawlow's dogs are ill-nourished, miserable creatures which suffer both from hunger and from pain. Contrary to this teaching, however, the dogs which I saw—and I passed through all the kennels—were all in admirable condition and appeared to take a hearty interest in life. Pawlow himself was extremely particular about the welfare and comfort of his animals. Many of them have been living for years with permanent fistulae. Such dogs really have an ideal existence, since they are fed almost continuously from morning to night, the greater portion being removed through the fistulae.

At the time the laboratories were erected it was generally recognized that the recovery rooms for the animals were superior to similar rooms in any of the hospitals in St. Petersburg. I found them to be scrupulously neat. It was possible to spray down all of the walls as well as to flush out the floors and hallways. Smoking was not permitted within

the building and special rubber shoes were worn in the operating room.

The gastric juice from the experimental animals now has a great sale. The proceeds of this enterprise practically keep the institute. Only a modest sum is available from the government for this purpose. It is interesting that the greatest demand for the Magensaft comes on the mornings following the national holidays. Such festal days are of very frequent occurrence in Russia. Other factories now produce a large amount of this material. Since Pawlow's product, however, is more perfectlyodorized, it continues to be the superior brand.

Paper of DR. REID HUNT:

PAUL EHRLICH.

VERY few men have touched upon as many fields as did Ehrlich. It would be interesting to discuss his activities from many points of view. This evening, however, I shall speak of him from the pharmacological standpoint.

It is a remarkable fact that Ehrlich never recorded a negative experiment. There have been very few investigators, notwithstanding, who have conducted as many negative experiments. His work on arsenic is a very good illustration of this. While he prepared over twelve hundred compounds, only about six have been described.

His papers were always hastily written. As someone has said, they were "just spit out." This serves to explain, in part, the difficulties met with in reading some of them. Frequently in preparing such a communication he would walk up and down the length of his office shouting out his ideas in imperfectly rounded sentences. His assistant, Sachs, who was in no sense a stenographer, would take down as much as he could and later submit the proof to him.

His addresses and lectures were prepared in the same hasty manner. Sachs once described to me a trip which he had taken to Berlin with Ehrlich. Ehrlich dictated his address on the train, profusely illustrating his remarks with colored pencil figures which he drew on the windows and door posts. The other occupants of the compartment of course thought that Sachs was conducting an insane man to some institution.

When he decided to come to Baltimore and lecture, he had at least seven months in which he could prepare his address. This engagement furnished him with endless excuses to extricate himself from unwelcome dinners and other social functions. I found him half an hour before the meeting, however, without any visible manuscript. When I asked him if he had not written it on the boat coming over, he said no, but added that he was busy writing it then.

Unlike most men of prominence, he had no hobbies. His interests were very narrow, and it was extremely seldom that he attended theatres or similar places of amusement. As for reading literature, I only knew him to go through one novel, and that was a German translation of David Harum which someone presented to him. Strange to say, this book somehow pleased him, and throughout the following winter he quoted from it frequently. Often he likened himself to David Harum and boasted of his shrewdness.

It was in 1902 when I went to his laboratory to work. At that time his studies on immunology were attracting great attention. I was greatly surprised and disappointed when, instead of encouraging me to take up a problem in the same field, he told me to stay in pharmacology.

He had a marvellous mind. It seemed as though he could visualize the structural formula for almost any alkaloid, anilin dye or other organic compound. Just to mention such a substance would be like touching a button to set him off.

He soon set me to work on the study of cocain derivatives. Though these efforts yielded nothing of direct value, they furnished experience and insight into his work.

Ehrlich's work on cocain and its derivatives led him directly into the studies on immunity. From his feeding experiments with ricin he was able for the first time to demonstrate an immunity for drugs. These studies likewise furnished the first demonstration of immunity by means of test tubes.

The first incentive to investigate probably came when he was a second year medical student. He read a paper on lead poisoning, and, though it was subsequently shown to be full of errors, it nevertheless impressed him with the idea that the proper way to study pharmacology is to investigate the direct action of drugs on the tissues. Before long he discovered that very little advance could be made with lead salts in such a line of work, and he was led to consider substances like anilin dyes. He was interested in the products of anilin, however, only from the physiological point of view. As he said, he used the dyes to surprise the cells, to study the affinity of the cells for the dye-stuffs, etc.

Ehrlich was born in 1854, and the first anilin dyes were made in 1856, so that they came into the world almost simultaneously. As a student, before he entered the university, he showed a rather marked talent for mathematics. On one occasion his success in this branch led the teacher to excuse him from taking the final examination. This privilege, however, was subsequently revoked, due, the story goes, to the contents of an essay which he wrote on life. "Life," he said, "is a process of oxidation; even the brain itself merely represents oxidative processes. Dreams are the product of abnormal oxidation resembling, in a way, phosphorescence." Though he failed in certain studies in the later years of college life, his research work was always of such an excellent character that it enabled him to obtain his degree. In the University at Berlin he managed to free himself from the routine work by leaving the details for other men.

Following his graduation, he accomplished an enormous amount of work on blood, on poisons, on certain antipyretics, etc.

About 1887 he acquired tuberculosis and was forced to give up his work for a year. He returned as one of the first patients of Koch who had used tuberculin with success. Ehrlich always attributed his recovery to this agent.

At this time, as he had no official position, he was compelled to rent a building and equip a small laboratory of his own. The local street railway company furnished a room in which he was able to keep his experimental animals. This period of self-support, which covered about three years, left him with a little ill feeling for the university institute, and this he retained throughout his life.

In 1890 Koch took him into his institute. Ehrlich had previously made some studies on methylene

blue and he now worked out an improved method for staining the tubercle bacilli.

Before long, he started some work with von Behring, who had come to Koch a few years earlier. Ehrlich and von Behring were born in the same year, within a few hours of each other. Germany celebrated their birthdays together.

The investigations leading to the discovery of salvarsan began in more or less an accidental manner. In passing through Berlin, a friend told Ehrlich of his recent work on trypanosomes. The problem fascinated Ehrlich and he set me to work studying the effects of anilin dyes on these organisms. Later he chose arsenic and then carried out his enormous researches on the arsenic derivatives.

Discussion: DR. CUSHING.

ERNEST G. GREY, M.D.

Book Reviews.

Sexual Impotence. By VICTOR VECKI, M.D.
Fifth edition. Enlarged. Philadelphia and London: W. B. Saunders Company. 1915.

The first American edition of this work, published in 1899, was reviewed in the issue of the JOURNAL for Dec. 14 of that year (Vol. cxli, p. 607). The fourth edition was reviewed in the JOURNAL of Nov. 28, 1912 (Vol. clxvii, p. 772). The present fifth edition has been revised and enlarged by additions and a few modifications in the light of recent advances in the science of urology, particularly with reference to psychotherapy and to the local treatment and medication of the deep urethra. Apart from these obvious changes, there seems no reason to modify our previously expressed opinions of this book.

A Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M.D. Twelfth edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1915.

The first edition of this work appeared in 1897. The previous edition came out in 1913. The present edition brings this standard textbook up to date and considerable new subject matter has been introduced in the fields in which important medical advances have been made. As is inevitable, when one man, however learned and industrious, attempts to cover the whole field of medicine, including diseases of the nervous system, some parts are much more thoroughly and accurately treated than others. On the whole the text-book is sound and conservative and covers the field of medicine as well as it is humanly possible for one book and one man to accomplish this task.

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MASSACHUSETTS MEDICAL SOCIETY MEETING.

THE one hundred and thirty-fifth annual sessions of the Massachusetts Medical Society and its sections are to be held in Boston on Tuesday and Wednesday of next week, June 6 and 7. Editorial comment upon this approaching anniversary appeared in the issue of the JOURNAL for April 20; and the complete program of the various meetings is published in another column of the present issue. Particular attention is called to the full program of clinics and demonstrations to be given Tuesday morning at the several Boston hospitals.

In conjunction with the meeting of the tuberculosis section, attention may also be called to the leading article in this week's issue of the JOURNAL by Dr. John B. Hawes, noting the progress made during the past five years in the

diagnosis and treatment of consumption by the general practitioners of Massachusetts. The papers by Dr. Frederic J. Cotton, and by Drs. Hugh Cabot and E. Granville Crabtree are appropriate in connection with the surgical symposia of the coming sessions.

As official organ of the Massachusetts Medical Society, the JOURNAL will publish next week a general account of the meeting; and in subsequent issues will print full reports and proceedings, and the complete text of papers presented. In behalf of the Boston profession, the JOURNAL extends a most cordial and enthusiastic greeting to visiting members of the Society.

FAILURE OF MILK LEGISLATION IN MASSACHUSETTS.

IN previous issues of the JOURNAL during the past spring we have from time to time commented on the progress of attempts to secure the passage by the General Court of adequate legislation for control of the production, transportation, and distribution of milk in Massachusetts. Particularly did we advocate and recommend the enactment of the so-called McLaughlin milk bill, which represented the expert judgment of the Massachusetts Health Commission, in the light of the investigation reported by the Massachusetts Milk Commission, and which was approved by the Massachusetts Medical Society, the Massachusetts Anti-Tuberculosis League, the Boston Milk and Baby Hygiene Association, and other medical and public health organizations.

Both the McLaughlin bill and its rival, the Williams-Pratt bill, were adversely reported by the joint committees of public health and agriculture; and on April 26 this report was accepted by the House. An attempt was made on April 27 to secure reconsideration of this action, but this was refused by a vote of 109 to 101. The only remaining hope lay in a revival of the McLaughlin bill in the Senate, which was urged to substitute it for the adverse committee report. This was earnestly attempted. In the daily press of April 27 appeared a letter by Mrs. William Lowell Putnam, summarizing in part as follows the present milk situation in Massachusetts:

"For the ninth consecutive year a bill is before the Legislature to give to the State Health Department the power to protect the public health by safeguarding its milk supply. Without the ability to control the condition of the food chiefly consumed by the most delicate members of the community, no health official can be held responsible for the welfare of the people whom he serves.

"Dr. Charles Harrington, secretary for many years of the State Board of Health, introduced the first bill in 1908, and after its failure to pass the Legislature he asked the help of the consumers of milk for the bill which he intended to introduce again the following year. He died before the time came round again, so the consumers introduced the bill themselves, and every year since then, following in his footsteps, they have worked for this legislation. Twice it was passed by the Legislature and twice it has been vetoed by a governor who was willing to jeopardize the lives of the people and the welfare of the farmers by vetoing the bill to propitiate certain interests.

"The clean Massachusetts farmers need the protection of this legislation for the promotion of their prosperity almost as much as the consumers need it for the protection of their lives. One of these governors was re-elected, but the other failed of re-election.

"Once more a similar bill is before our representatives assembled to work for our welfare. This time the bill is introduced by the new State Health Commissioner after a study of the conditions of milk production throughout the State, which has never been equaled in its completeness. The bill is indorsed by the city of Boston, by the Association of Local Boards of Health, and by the president of the State Dairy-men's Association. A majority of the executive committee of the State Grange has indorsed it and appointed one of its number to defend its interests in the matter of the bill before the legislative committee having it in charge. The fact that the Master of the State Grange is now opposing it merely indicates the divided condition of the Grange in this Commonwealth.

"This bill safeguards the farmer's interest by providing for public hearings before any regulations are passed, and these again require the ratification of the governor and council before becoming law. Moreover, it contains provisions for the grading of milk according to the plan carried out in New York for some time past with great success. By this grading system the farmers who choose to produce a high grade of milk will receive a suitable price for their product, as the quality of the milk will be guaranteed by the health authorities on the label of the bottle. No such guarantee exists at present, and nobody wants to pay the price which first-class milk should command

when he can feel no reasonable certainty that he is getting what he pays for.

"The only guarantee furnished at present to the consumer who wants the best kind of milk involves paying the cost of the fancy and expensive frills attendant on making 'certified' milk. Those of us who can afford it pay this extra price at present, but with a properly graded milk, with the guarantee of the State Department of Health upon it, we should be able to buy safe milk at a reasonable price, and the difference between the cost of such milk and that of a lower grade could be demanded by the producer. The Massachusetts farmer needs protection from out-of-State milk, which is usually old and sometimes worse, and this bill would give him this protection. He has not got it now.

"Again the bill is here, with this new and valuable addition recommended highly by the Boston Chamber of Commerce in its recent report on milk conditions. Shall we once more allow politics to come between us and the health, the happiness, the very lives of our children? Shall we let this same game continue to injure the dairy farmers of the Commonwealth? It lies with the public to decide. The final cause of the failure of the bill through these many years has been the indifference of the consuming public."

Probably it is true that public indifference is the ultimate cause of the failure of milk legislation, though the immediate cause is largely political. Certainly the medical profession has done its part towards securing such enactment. Thus far the attempt to revive the McLaughlin bill in the Senate has also failed, and it appears that there must be at least another year's delay before the question of milk supply in this Commonwealth can be dealt with adequately. On Monday, May 22, however, at a hearing before the Ways and Means Committee of the House of Representatives, the passage of the McLaughlin bill was again advocated by Dr. Charles F. Withington, as president of the Massachusetts Medical Society, and by others. The proponents emphasized the need of a central authority to enforce proper regulations for the production and sale of milk in localities where local health boards fail to do their duty. They said that the bill was the result of conferences and compromises and was satisfactory to a great majority of the interested parties. The milk problem is essentially a problem of infant welfare, and is apparently one upon which further education of the public is needed for its satisfactory solution.

THE LEPER IN MEDIAEVAL TIMES.

In a lecture on Leper Houses and Mediaeval Hospitals,* delivered before the Royal College of Physicians, London, a very interesting picture is given of the status of the leper in the Middle Ages.

The number of lepers at one time must have been very great, particularly upon the Continent. When Louis VIII, in 1226, made regulations for the leper houses in France, it was reckoned that they were two thousand in number. The disease appeared to have reached its height about the second half of the twelfth century, and diminished rapidly after the Black Death in 1348-49.

Although isolation of lepers in very early times was probably due to the belief that they were wicked people who were being punished for their sins, the fear of contagion later became the chief reason for their isolation. Once a person was adjudged a leper, he was regarded as dead; his estate was divided; in some countries his wife could marry again. He was bound by the strictest sort of regulations to come in contact with none but lepers.

With as much as this at stake, the accurate diagnosis of leprosy became of the greatest importance. Three stages of the disease were recognized by Bernardus de Gordonio: the occult or premonitory; the infallible, characteristic of the disease; and the terminating stage. It was apparently the custom to make a definite diagnosis only in the second and third stages; in the early period of the malady, suspected persons were watched, but were not isolated.

Very perfect descriptions of the various types of leprosy had been written by Aretæus of Capadocia, by Galen and by Oribasius. To the graduate in medicine of mediaeval universities, therefore, the classical signs of the disease must have been very familiar. A translation of the writings of Bartholemy Glanville (about 1360) describes lepers as having "redde Whelkes and Pymples in the face, out of whome oftenne runne Blood and Matter: in such the Nose swollen and ben grete, the vertue of Smellynge faylyth, and the Brethe stynkyth ryghte fowle . . . unclene, spotyd, glemy, quytery, and Nosethrylles ben stopyt, the Wasen of the voys is rough and the voyse is horse, and the Heere falls."

It happened not infrequently that the question whether or not an individual was a leper was submitted to a tribunal of lepers, or sometimes to officials of the church, and there is some evidence that the diagnosis was not always correct. Some idea of the terrible life to which the leper was condemned is given by Mercier's description of the ceremony by which the unfortunate sufferer from leprosy was sent out of this life.

"Wrapped in a shroud, and placed on a bier he was carried into the church, his family and friends following as in funeral procession. Arrived in the church, which was hung with black as for a funeral, the leper was laid upon the ground, covered with a pall, and a requiem mass was said. He was then carried to the churchyard and laid beside an open grave, where the priest scattered dust three times upon his head, saying, 'Die to the world, be born again to God.' Then while the *Libera me*, the psalm for the dead, was chanted, the leper was conducted to his cabin, at the door of which the priest gave him his scrip for alms, his stoup for water, his wallet for scraps of food, his gloves, his cloak and his clapper, and addressed him in these terms: 'While you are diseased you will enter no house, no inn, no forge, no mill, nor in the common well or fountain will you drink or wash your clothes. You will not eat except by yourself or with other lepers. You will enter no church during service; you will mingle with no crowd. When you speak to any you will stand to leeward; when you beg for alms you will sound your clapper as a sign that you are forbidden to address any one. You will not go out without your cloak; you will not drink but from your own fountain, nor will you draw water from any well or fountain but that which is before your door. You will always wear your gloves, and will touch no well-rope without them. You will touch no child, not even your own; and you will return to your cabin every night.' In handing him the scrip the priest said, 'In this you will put the alms of the charitable, and you will remember to pray to God for your benefactors.' The priest then planted a wooden cross before the door, fixed to it an alms box, and himself placed the first donation therein. The priest addressed the leper thus: 'My brother, through suffering much tribulation, may you come to Paradise, where there is no sickness nor suffering, but all pure and clean, resplendent like the sun. There you will go, if it please God. *Pax vobiscum.*'"

* Charles A. Mercier, M.D.: *Glasgow Medical Journal*, January, 1915.

THE MEDICAL MEETINGS IN
WASHINGTON.

THE tenth triennial session of the Congress of American Physicians and Surgeons, and the meetings of its constituent societies, were held on May 9, 10, and 11 at Washington, D. C., and were attended by over 1000 members. The opening session, on the afternoon of May 9, was devoted to the topic of syphilis, with leading papers by Dr. John A. Fordyce and Dr. Homer F. Swift of New York and Dr. Hugh Cabot of Boston. On the evening of that day the presidential address was delivered by Dr. William S. Thayer of Baltimore on "Practice and Teaching." The subject of the afternoon session of the congress on May 10 was immunization and its practical applications, with leading papers by Dr. Theobald Smith of Princeton, Dr. Ludwig Hektoen of Chicago, and Dr. William H. Park of New York.

Among the fourteen component medical organizations, whose meetings were held simultaneously, three were under the presidency of Boston physicians: the American Dermatological Association, of Dr. Charles J. White; the American Orthopedic Association, of Dr. Charles F. Painter; and the American Society of Tropical Medicine, of Dr. Milton J. Rosenau.

On May 7, just prior to the Washington congress, the twenty-second annual meeting of the American Laryngological, Rhinological, and Otological Society was held at White Sulphur Springs, West Virginia. The principal address was by Dr. Charles P. Grayson of Philadelphia on "Our American Voice and Articulation." The following officers were elected for the ensuing year: Dr. Thomas J. Harris of New York, president; Dr. John Culp of Harrisburg, Penn.; Dr. John E. Brown of Columbus, Ohio; Dr. Richmond McKinney of Memphis, and Dr. James A. Patterson of Colorado Springs, vice-presidents; Dr. William H. Haskin of New York, secretary; and Dr. Ewing W. Day of Pittsburgh, treasurer.

On May 11 and 12, in Washington, D. C., was held the annual meeting of the National Association for the Study and Prevention of Tuberculosis; and on May 12 the annual meetings of the American Sanatorium Association and the National Conference of Tuberculosis Secretaries.

An urgent plea for the establishment of a

strong division of tuberculosis in the public health service of the United States was made by Mr. Homer Folks, secretary of the State Charities Aid Association of New York State, who spoke on "Interstate Control of the Tuberculosis Problem."

"In the United States tuberculosis has been mainly a local problem. The time has come at last when the federal authorities should assume that degree of efficient leadership which they are exercising in the problems of agriculture and other economic interests.

"Only through the United States Public Health Service can any degree of uniformity of method and efficiency in the tuberculosis campaign in forty-eight different states be secured.

"The standardization of hospitals, sanatoria, dispensaries, nursing service and home supervision and all the other elements in the tuberculosis movement can only be secured through federal action. Just as the state helps to co-ordinate the work of the localities within the state, so the federal authorities should help to co-ordinate the work in the various states. Only in this way can the vital national interest in the supervision of tuberculosis be made effective."

On the evening of May 12, the twentieth annual meeting of the Washington Medical and Surgical Society was held in that city, under the presidency of Dr. Reginald R. Walker.

The address of the evening was made by Dr. Edward Martin of Philadelphia, who spoke on "Psychological Surgery." Discussions followed in which Dr. William S. Thayer, of Johns Hopkins University, and Dr. Shelton Horsley were participants. An address was also made by Dr. John D. Blake, of Baltimore.

SOCIAL SERVICE AT THE MASSACHUSETTS GENERAL HOSPITAL.

THE tenth annual report of the Social Service Department of the Massachusetts General Hospital is concerned largely with the consideration of the question, "What shall be the attitude of the Department toward the increased amount of work which it is called upon to do?"

The demands of social service upon its workers are severe and necessitate the throwing of one's personality into the consideration of each case. This kind of work cannot be done indefinitely; it is too fatiguing. The number of patients who can be treated properly in a day is limited, and the limit has now been reached. This is in spite of the fact that the Social Serv-

ice has, as far as possible, distributed its patients among local organizations such as Associated Charities and Visiting Nursing Associations. The Department very wisely decides to maintain the quality of work, and to treat fewer patients well rather than more patients poorly.

As Miss Cannon, Chief of the Department, points out in her report, the excessive demand for social service is due partly to the lack of local organizations in smaller cities and towns, but chiefly to general economic conditions. Social workers see their patients as "accumulated evidence of the background from which they come—from the crowded tenements and straining industries, from the crowded streets and oppressing ignorance which surrounds them."

The report from the Children's Clinic states that special care is being given to the home conditions of children with heart disease, of which there were 101 under treatment in 1915, and to the regulation of feeding of such infants as do not live in districts in which the Milk and Baby Hygiene Association maintains stations.

The report from the South Medical Clinic for Syphilis shows that of the 1118 new patients received during 1915, only 107 (9.5%) were lost track of. The remaining 90.5% were under treatment, under observation, or had been referred to other clinics or to private physicians. The observation is made that patients present themselves for treatment at an earlier stage of the disease than formerly, and give evidence that they are realizing more and more their own responsibility in the matters of individual cure and community protection.

During the year 1915, the Social Service Department cared for 2355 new patients and 652 carried over from previous years.

THE BOSTON MEDICAL LIBRARY.

THE Boston Medical Library performs its duties to the community so well, in spite of serious handicaps, that the profession at large does not realize how fundamental are its needs. The necessity for more stack room is imperative; the desirability of completing the façade of the building on the Fenway is obvious. A part of this structure may perhaps be postponed for a year or two, but that portion of walls and roof essential to cover and protect new steel stacks, and the stacks themselves, must

be erected in the immediate future. For this purpose a committee has been formed, and is already soliciting contributions. At least \$60,000 are needed at once. This money will suffice for a stack room probably large enough for storage of books during the next decade. At present thousands of volumes and pamphlets are piled in the basement; hundreds and hundreds never having been sorted—and in some instances never even unpacked. These books cannot at present be put into circulation, nor even consulted in Holmes Hall; the existing stacks are pitifully overcrowded, making the duties of officials and pages a hundred per cent. greater than need be.

The Boston Library is fourth among collections of medical books in the United States; it is constantly growing; it renders important services to the entire community; citizens of Greater Boston should be, and presumably are, willing to help in its proper expansion and maintenance: each member of the medical profession should emphasize the pressing needs of the Library to friends and patients, who otherwise might be ignorant, not only of what the Library lacks, but also of what it possesses. The medical profession as a whole has an enormous latent power of influencing popular opinion and action; this power is too infrequently used. Let it be abundantly exercised in aid of the present worthy object.

MEDICAL NOTES.

TUBERCULOSIS IN THE DISTRICT OF COLUMBIA.—The commissioners of the District of Columbia have under consideration a new series of regulations to control the spread of tuberculosis in that region, proposed by Dr. William C. Woodward, the local officer of health.

"They will, if adopted, prevent any person suffering from this disease from engaging in the business of manufacturing, cooking or selling food, receiving employment as a barber or hairdresser, using public bathing places or attending any public or private school.

"It is proposed that the regulations become effective the first of next October. Before acting on them the Commissioners will endeavor to obtain an expression of public opinion as to the need for a law of such drastic requirements. It is probable that a hearing will be held.

"While the promulgation of the regulations will work hardship in certain cases, it is believed that the acts which they forbid are dangerous to the community in that they tend to spread tuberculosis. If this be true, the hard-

ship that may be imposed upon individual patients suffering from tuberculosis by the promulgation of these regulations will be less than the hardship that will result from failure to promulgate them.

"Dr. Woodward expressed the hope that there would be sufficient community expression of opinion to guide the Commissioners in determining their action in the case. He also suggested that the authority of the Commissioners to promulgate such a law be referred to the corporation counsel for an opinion."

SOCIAL INSURANCE INQUIRY.—Under the auspices of the Committee on Insurance of the New York Chamber of Commerce, arrangements are being perfected for a comprehensive investigation into all essential phases of the subject of social insurance, between this and the next meeting of the New York Legislature, with special regard to health insurance. Dr. J. F. Crowell, executive officer of the Chamber of Commerce, to whom communications may be addressed, will have charge of the inquiry.

It is the purpose of this committee to go extensively into the subject, so as to have at hand the desired data and to avail itself of the gist of experience in this and other countries. This inquiry will extend not only to the actual developments in countries where health insurance has made some progress, but is intended also to include a critical examination of the conditions, causes and effects of the different systems with a view to their availability for American communities. It is intended to test the claims which existing systems made at the time of their origin in the light of results.

MUSHROOM POISONING.—Dr. W. A. Murrill, assistant director of the New York Botanical Garden, writes that there has just come to his notice a very serious case of mushroom poisoning, in which the poisonous specimens were taken from mushroom beds and were supposed to be a new edible variety. The common mushroom had been cultivated successfully in these beds for two years. Five persons ate the supposed new variety and enjoyed its flavor, but were almost immediately stricken with paralysis, their lives being saved only by the prompt action of their family physician. This indicates that it is very unwise to eat or sell any mushroom appearing in mushroom beds except the ordinary cultivated variety with white cap and pink gills. A description of this new poisonous mushroom has been prepared for immediate publication in *Mycologia*.

TYPHOID CARRIERS.—In case a typhoid carrier is discovered by the New York City Department of Health he is notified either directly or through his physician that he harbors the ty-

phoid bacillus, and is given careful directions to prevent infection of others. These directions cover the handling of food, the care of excreta and personal cleanliness. He is advised to keep the Department of Health informed of his whereabouts and to have his stools examined from time to time for typhoid bacilli. The vaccination against typhoid fever of everyone with whom he lives is strongly insisted upon.

MEDICAL ADVISOR FOR QUESTIONS RELATING TO VENEREAL DISEASE.—The New York City Board of Health has appointed a medical advisor, to whom those who have or who think they have, venereal disease may apply for advice. The advisor limits his activities to advisory and educational efforts, giving no treatment whatever, and referring such cases as require treatment to the private physician or to clinics, according to circumstances. During 1915, 1910 patients applied who, in the opinion of the medical advisor, required treatment. Of these 702 were referred to the examining physician and 1208 to the clinic. Of the latter group, practically all were unemployed for varying periods at the time they consulted the medical advisor.

TRANSFER OF NEW YORK QUARANTINE STATION TO FEDERAL CONTROL.—Pending the completion of arrangements to transfer the New York quarantine station from State to Federal control, Dr. L. E. Cofer, Assistant Surgeon-General, U. S. Public Health Service, has just been appointed Health Officer of the Port of New York. The transfer was urged by Governor Whitman in his annual message. As passed by the Legislature, the bill provides for the appointment of a commission to negotiate the details of the transfer, including the appraisal and sale of the State property to the Federal Government. The bill had the active support of many civic, public health and business organizations, and represents the successful completion of a campaign begun some years ago by the Public Health Committee of the New York Academy of Medicine.

With the exception of the station at Baltimore, the United States Public Health Service now controls all the maritime quarantine stations in the United States and its dependencies.

PROPOSED AFFILIATION ABANDONED.—In the JOURNAL of May 13, 1915, comment was made on the proposed affiliation of Columbia University with the Presbyterian Hospital and the purchase of the former site of the American League baseball grounds for the erection of a new medical school. It is now reported that the million dollars necessary to take up the option on the property could not be raised, and the plan has, therefore, been abandoned. From

many points of view this is much to be regretted.

RECENT MEDICAL LEGISLATION.—Last year the New York Board of Health, acting under the provisions of Section 1176 of the Charter of the City of New York, issued orders to various transit companies requiring them to limit the total number of passengers on any car at any time to one and one-half times the seating capacity of the car. The basis for this order was the fact that overcrowding constituted a danger to the public health because of the increased liability of the communication of infectious diseases such as pneumonia, bronchitis, influenza and tuberculosis. Bacteriological examinations of air in crowded cars have shown the presence of the germs of these diseases, and have shown that the number of bacteria increases in proportion to the degree of crowding. Persistent pleas for relief to the public service commission having resulted in no effective action, the Board of Health felt obliged to take this action, which clearly came within its powers.

In order to nullify this order of the Board of Health, a bill was passed in the closing days of the Legislature and is now before the Governor, which amends the public service commission law so as to vest the power to regulate the number of passengers to be carried in street cars solely with the public service commission. This bill, known as the Simpson bill, if permitted to become a law, will constitute the first invasion of the authority vested in the Board of Health for the protection of the lives and health of the people of the City of New York. The establishment of this restriction upon the legitimate authority of the Board of Health would establish a vicious precedent. The way would then be paved for other interests to ask for special legislation as a means of evading their responsibilities under the public health law.

CAMPS FOR MEDICAL RESERVE CORPS.—Owing to the withdrawal of troops from their regular stations for duty on the Mexican border, the United States War Department has been compelled to abandon the instruction camps for officers of the Medical Reserve Corps that had been planned for the coming summer.

FIRST HAY-FEVER ORDINANCE.—Through the efforts of the American Hay-Fever-Prevention Association, the City of New Orleans, La., has enacted the first hay-fever ordinance in America. While hay fever is not a disease that figures in the death rate, it is a disease that occasions much suffering and annoyance to those afflicted, who are said to number about 2 per cent. of the population in many sections of the United States.

The ordinance reads as follows:

An ordinance for the better protection of the public health, and particularly to prevent the spread of disease.

Section 1. Be it ordained by the Commission Council of the City of New Orleans, That;

1. The tenant or occupant of any leased or occupied premises, lot or other area shall not permit weeds or grass over two feet in height to grow or stand on the premises, lot or area leased or occupied by him.

2. The owner of any premises, lot or other area, not leased or occupied by another person, shall not permit weeds or grass over two feet in height to grow or stand on such premises, lot or other area owned by him.

3. The tenant or occupant of any leased or occupied premises, lot or other area shall not permit weeds or grass over one foot in height to grow or stand on the sidewalk or banquette abutting the premises, lot or other area leased or occupied by him.

4. The owner of any premises, lot or other area, not leased or occupied by another person, shall not permit weeds or grass over one foot in height to grow or stand on the sidewalk or banquette abutting such premises, lot or area owned by him.

5. A firm or corporation having franchise rights or privileges on the streets shall not permit weeds or grass over one foot in height to grow or stand on any street or area, or any part thereof, which, by the terms of its franchise, it is bound to care for or to keep in good order, condition or repair.

6. For the purpose of enforcing the provisions of this ordinance, a corporation shall be deemed to be represented by its president, or in his absence by its vice-president, or in the absence of both by the officer or individual in charge of the affairs of the corporation, and such representatives shall be held responsible and punishable for any violation by the corporation of the provisions of this ordinance.

7. Each of the members of a firm shall be held responsible and punishable for any violation by the firm of the provisions of this ordinance.

8. For every violation of any of the provisions of this ordinance, the person responsible shall, on conviction, be punished by a fine of not less than one dollar, nor more than twenty-five dollars, and in default of payment of the fine, by imprisonment in the parish prison for not less than ten days nor more than thirty days, or both, in the discretion of the court having jurisdiction.

Section 2. Be it further ordained, etc., That all ordinances and parts of ordinances in conflict with the provisions of this ordinance be and the same are hereby repealed.

Adopted by the Commission Council of the City of New Orleans, January 25th, 1916.

THE COST OF LIVING.—The Bureau of Public Health Education of New York City has issued a booklet printed in English and Jewish in which are given simple general directions as to the purchase and care of foodstuffs, several pages of simple menus and a number of recipes for preparing these articles of food. The list of foods described has been tested practically for about two years by the social service department of the Beth Israel Hospital. The nutritional results have been excellent; the diet suggested, which is for a family of five, provides approximately 9500 calories a day. On the assumption that the family consists of two adults and three children, this is ample. The food supplies 450 grams of protein daily and a proper proportion of acids, bases and vitamins. Food, according to these lists, sufficient to feed a family of five for a week could be purchased in the New York market for \$7.31.

ST. MARY'S HOSPITAL, ROCHESTER, MINN.—The twenty-sixth annual report of St. Mary's Hospital, Rochester, Minn., records for the year ended December 31, 1915, a total number of surgical operations of 10,110 and a total number of patients operated upon of 8265. The Hospital cared for 243 medical patients in this time.

NATIONAL TUBERCULOSIS ASSOCIATION MEETING.—At the twelfth annual meeting of the National Association for the Study and Prevention of Tuberculosis, held in Washington on May 11 and 12, Dr. Joseph H. Pratt of Boston read a paper on "Results Obtained by the Class Method of Home Treatment in Pulmonary Tuberculosis, During a Period of Ten Years," and Michael M. Davis, Jr., Director of the Boston Dispensary, Boston, read a paper on "Pay Clinics for Tuberculosis."

DISEASE AND WORKMEN'S COMPENSATION LAW.—The Supreme Court of Rhode Island has decided that an injury resulting from a fall which was partly "due to dizziness or unconsciousness induced by a disease" was an injury "arising out of and in the course of" employment, for which the employee was entitled to compensation under the workmen's compensation law. The injured employee was a hack driver who was suffering from "hardening of the arteries and Bright's disease." He fell from the seat of a hack which he was driving and was seriously injured.

WAR RELIEF FUNDS.—On May 27, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund.....	\$120,644.48
Allied Fund.....	102,899.91
Serbian Fund.....	98,211.01
French Wounded Fund.....	83,551.46
French Orphanage Fund.....	52,354.08
Armenian Fund.....	40,004.74

Polish Fund.....	35,730.06
Surgical Dressings Fund.....	27,074.17
Facial Hospital Fund.....	20,274.00
Italian Fund.....	17,508.91
Belgian Tobacco Fund.....	2,326.18
Artists' Fund.....	2,144.00
Allies' Tobacco Fund.....	1,439.75
Permanent Blind Fund.....	704.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH-RATE IN BOSTON.—During the week ending May 27, 1916, there were 273 deaths reported, with a rate of 18.72 per 1000 population, as compared with 222, and a rate of 15.47 for the corresponding week of last year. There were 51 deaths under one year as compared with 37 last year, and 70 deaths over 60 years of age against 65 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria 27, scarlet fever 32, measles 228, typhoid fever 1, whooping cough 38, and pulmonary tuberculosis 62.

Included in the above were the following cases of non-residents: Diphtheria 1, and tuberculosis 4.

Total deaths from these diseases were: Diphtheria 3, scarlet fever 1, measles 4, whooping cough 4, and tuberculosis 17.

Included in the above were the following deaths of non-residents: Diphtheria 2, whooping cough 1, and tuberculosis 1.

ORGANIZATION OF THE NEW ENGLAND SURGICAL SOCIETY.—It is announced that the organization of the New England Society is completed. The plan of the Society is to meet annually in some one of the New England States, and arrangements have been made to hold its first meeting in Boston on October 5, 6 and 7, 1916. The committee in charge of this meeting consists of Dr. William P. Graves, chairman, Dr. Charles A. Porter, Dr. Fred B. Lund, Dr. David Cheever, and Dr. Charles G. Mixer. The officers elected for the ensuing year are as follows: President, Dr. Samuel J. Mixer, Boston; Vice-President, Dr. John B. Wheeler, Burlington, Vt.; Secretary-Treasurer, Dr. Philemon E. Truesdale, Fall River, Mass. The executive committee consists of Dr. John W. Keefe, Providence, R. I.; Dr. Joseph M. Flint, New Haven, Conn.; Dr. Lyman Allen, Burlington, Vt.; Dr. Herbert L. Smith, Nashua, N. H.; and Dr. William L. Cousins, Portland, Me.

NEW ENGLAND DEACONESS ASSOCIATION.—The year-book of the New England Deaconess Association contains a report of the year's work at the hospitals of the Association at Boston and at Concord, N.H. The Boston Hospital cared for 1169 patients for the year ended December 31, 1915, and the Concord Hospital, 293. The nurse established at the North End Medical Mission has made 1488 calls to the people of

that vicinity and 2769 calls have been made by the district nurses. The William Nast Brodbeck cottage, opened in November, 1915, has increased the capacity of the Boston Hospital to seventy beds.

LEGISLATION FOR THE FEEBLE-MINDED.—The League for Preventive Work has recently published a pamphlet urging the appropriation of \$150,000 by the Massachusetts State Legislature for the erection of the new school for the feeble-minded. Physicians are asked, if the arguments presented in the pamphlet appear convincing, to write their senator and representative, urging the passage of this bill of appropriation. Among other things, they state that although there are about 15,000 feeble-minded in Massachusetts, less than 3,000 are receiving care in Waverley and Wrentham. Of the remaining 12,000 many are protected in good homes. Another group are sexually passive, industrially competent, and capable of adjusting themselves to community standards. For neither class is state segregation necessary nor desirable. Approximately 2000, however, can always be found in other public institutions. Those committed to insane hospitals are usually held in permanent custody; the others drift in and out of almshouses, prisons, and reformatories. These 2000, therefore, a constantly shifting group, represent many thousands of unprotected feeble-minded in the community, for whom custodial care is essential.

The development of state schools for the segregation of the feeble-minded meets the requirements of economy, justice, and efficiency. Their per capita cost for maintenance is less than that of other institutions. They furnish a simple environment which is adapted to the needs of defectives and which enables them to live happily on their own plane. They offer specialized industrial training which renders many of the inmates wholly or partly self-supporting within the institution, transforming them from demoralizing and destructive forces into productive members of the state. They furnish protection both to society and to the feeble-minded, for whom community life means danger and exploitation. And finally, by permanent segregation, they prevent the procreation of a new generation of defectives, thus cutting off at the source one of the greatest of social ills and striking at the root of the physical and moral degeneracy, pauperism and misery, alcoholism and crime, with which feeble-mindedness is inevitably linked.

The appropriation of \$150,000 this year for the erection of the first buildings for the new school for the feeble-minded, therefore, is the best investment the State of Massachusetts could make for the alleviation and control of a pressing evil, and for the protection of future generations.

RÉSUMÉ OF COMMUNICABLE DISEASES FOR APRIL, 1916.—Measles and whooping cough continued to hold the most prominent place in the communicable disease reports during April. The outbreak of anthrax at Woburn and Winchester and the presence of smallpox in Fitchburg, are the most striking items of the month.

Measles continues to be the greatest quantitative factor in the morbidity returns. This infection has spread to every part of the state. The region of greatest prevalence is the Eastern District, of which Brockton is the centre. The Connecticut Valley District, with Springfield as its centre, is running a close second. Reports show gradual extension of the disease to many of the smaller cities and towns. There has been a great improvement in the reporting of measles.

Scarlet Fever continues to decrease. This is true when comparing last month with April, 1915. The most gratifying point is the continued low fatality.

Whooping Cough has been less prevalent than during last month. There were more cases reported in April, 1916, than in the same month, 1915. This is probably due to better reporting.

Diphtheria is holding its own. There has been no marked change in the character or distribution of the infection. The continued low fatality (.059%) is the most gratifying point to be noted. No serious outbreaks have been reported in any part of the state.

Tuberculosis—The number of cases of tuberculosis reported was about the same as last month. This was considerably below the five year average for the month of April.

Typhoid Fever has shown a slight increase over the number of cases for last month and the same month of last year. However, this disease remains far below the five year average. The fatality rate (12.4%) more nearly approached the normal experience. This means probably more complete reporting of the disease.

Epidemics—During the month of April there have been three additional cases of anthrax reported. They were distributed as follows: Clinton (1), Winchester (1) and Woburn (1). All of the infected persons except one have been handlers of dried China hides. Fourteen of the cases have been in tannery workers, in Woburn and Winchester. The epidemiological investigation shows these cases came from infected hides shipped from China. A careful study is being made of the waste products and drainage from the infected tanneries and efforts are being made to prevent the further importation of infected material.

Rare Diseases—There have been six additional cases of smallpox reported in Fitchburg. In all of these the infection has been spread by contact with other cases. All have been removed to the smallpox hospital and all contacts have been vaccinated. The interesting point about this outbreak is that only one of the nine cases has a clear history of successful vaccination.

Pellagra has been reported from Worcester (1), Cambridge (1) and Northampton (1). All of these cases are receiving hospital treatment. *Trichinosis* has been reported from Springfield (1) and Boston (1).

Trachoma has been reported from Worcester (3), Northbridge (1) and Boston (4).

Malaria has been reported from Springfield (1), Newton (1) and Boston (2).

Massachusetts Medical Society.

PROGRAM OF THE 135TH ANNIVERSARY.

The 135th anniversary of the Massachusetts Medical Society will be observed on Tuesday and Wednesday of next week, June 6 and 7, in Boston. Following is the entire body of the program of exercises on both days:

GENERAL INFORMATION.

A BUREAU OF INFORMATION will be maintained by the Committee of Arrangements during Tuesday and Wednesday in the lobby of the Copley-Plaza Hotel, the headquarters of the Society during the Annual Meeting.

THE ANNUAL DINNER AND ALL GENERAL AND SECTION MEETINGS (with the exception of the combined meeting of the Sections of Medicine and Surgery on Wednesday afternoon) will be held as in 1915 at the Copley-Plaza Hotel. During both days of the meeting the facilities of the hotel will be at the disposal of the members of the Society, and parking space for automobiles, with supervision, will be provided. By arrangement with the management, rooms may be secured at a reduced rate by Fellows of the Society desiring to spend Tuesday or Wednesday night in Boston.

CLINICS AND DEMONSTRATIONS will be held at the various hospitals on Tuesday morning and will be related as far as possible to subjects to be discussed during the meeting.

The Boston Medical Library, 8 The Fenway, will be open for the inspection and use of the Fellows during the days of the meetings.

The Harvard Medical School, 240 Longwood Avenue, and the Tufts College Medical School, 240 Huntington Avenue, will be open for inspection by the Fellows both Tuesday and Wednesday.

JUNE 6, 1916.

TUESDAY MORNING.

CLINICS AT THE VARIOUS HOSPITALS.

AT THE BOSTON CITY HOSPITAL.

There will be operative clinics in the Surgical Amphitheatre and in the Gynecological Examination Room at 10 o'clock A.M., and visits and exhibition of cases in the Medical Wards at 10 o'clock A.M.

AT THE MASSACHUSETTS GENERAL HOSPITAL.

- 10.00 A.M. The Industrial Clinic. Dr. Wade Wright.
- 10.10 A.M. Hemophilia. Dr. G. R. Minot.
- 10.20 A.M. Spinal Fluid Findings Characteristic of Cord Compression. Dr. J. B. Ayer.
- 10.30 A.M. Xeroderma Pigmentosum. Dr. J. H. Buford.
- 10.40 A.M. Tuberculosis of the Tongue. Dr. F. E. Garland.
- 10.50 A.M. The Present Status of the Wassermann Reaction. Dr. C. M. Smith.

- 11.00 A.M. The X-Ray Treatment of Graves' Disease. Dr. M. Seymour and Dr. G. W. Holmes.
- Surgical Operations by Drs. Scudder, Porter, Brackett, Cobb, Greenough and their Associates.

AT THE PETER BENT BRIGHAM HOSPITAL.

- 9.00-12.30 A.M. Routine operative work for the day.
- 9.30 A.M. Respiration Laboratory: Demonstration of Method of Determining Basal Metabolism. Dr. Boothby.
- 10.30 A.M. Demonstration of Cases of Chronic Nephritis and Diabetes with Special Reference to Tests for Renal Function and Acidosis. Dr. Peabody and Dr. Frothingham.
- 11.30 A.M. Trigeminal Neuralgia. Dr. Cushing.
- 11.50 A.M. (a) Treatment of Ruptured Liver; (b) Some Aspects of Colonic Stasis. Dr. Cheever.
- 12.10 P.M. Types of Empyema Cavity with Special Regard to Prognosis and Treatment. Dr. Homans.

AT THE ROBERT BENT BRIGHAM HOSPITAL.

- Symposium on Arthritis at 10.00 A.M., by Drs. L. M. Spear, C. F. Painter, C. H. Lawrence, and L. T. Brown; followed by ward visits.

AT THE CARNEY HOSPITAL.

- 9-12 A.M. Orthopedic Operations. Dr. W. R. MacAusland and Dr. A. R. MacAusland.
- 9-12 A.M. Gynecological Operations. Dr. Johnson and Dr. Rushmore.
- 10.00 A.M. Medical Ward Visit. Dr. Leen and Dr. Fennessey.
- 10.30 A.M. Demonstration of Wassermann Reaction. Dr. Walsh.

AT THE CHILDREN'S HOSPITAL.

- 10.00 A.M. Cases from Medical Wards. Dr. J. L. Morse.
- 10.40 A.M. Tendon Transplantation in Infantile Paralysis. Reduction of Congenital Dislocation of the Hip. Dr. R. W. Lovett.
- 11.20 A.M. Pyloric Stenosis. Dr. J. S. Stone.
- Tuberculous Cervical Adenitis. Elbow Joint Fractures. Dr. Wm. E. Ladd.
- Demonstration of Results of Treatment of Birthmarks; Spina Bifida and Tendon Sutures. Dr. T. W. Harmer.

AT THE INFANTS' HOSPITAL.

- 9.30 A.M. Intravenous Injection in Infants. Collecting Blood for Wassermann Test. Lumbar Puncture. Duodenal Feeding and Diagnosis by Duodenal Catheter. Drs. Howell and Grover.
- 10.30 A.M. Ward visit, demonstration of unusual cases, and care of premature infants.

AT THE FREE HOSPITAL FOR WOMEN.

- Room No. 1. DR. GRAVES.
- 7.15 A.M. Plastic and Coeliotomy for Retroversion.
- 8.30 A.M. Amputation of Cervix and Coeliotomy for Prolapsed Uterus.
- 9.30 A.M. Coeliotomy for Fibroid.
- 10.30 A.M. Plastic and Coeliotomy for Retroversion.
- Room No. 2. DR. WADSWORTH.
- 7.30 A.M. Plastic and Coeliotomy for Prolapse.
- 9.00 A.M. Plastic and Coeliotomy for Retroversion.

AT THE BOSTON LYING-IN HOSPITAL.

- 9.00 A.M. Demonstration of Methods for the Administration of Gas-Oxygen in Obstetrics. Dr. F. C. Irving.
- 9.30-11 A.M. Major Obstetrical Operations. Drs. H. T. Swain and J. R. Torbert.
- (Should suitable cases be available.)
- 11.00 A.M. The Modern Treatment of Toxemia of Pregnancy. Dr. F. S. Newell.
- Pregnancy Clinic, 4 McLean Street.

9.30-11 A.M. Routine Methods of Prenatal Care. Demonstration of the Care of the Complications of Pregnancy.
Drs. J. L. Huntington and J. B. Swift, Jr.

AT THE FORSYTH DENTAL INFIRMARY FOR CHILDREN.
Surgical Department.

The Surgical Staff, under the direction of Dr. William E. Cheney, will operate on nose and throat, and cases of oral surgery, in the Amphitheatre from 10.00 A.M. to 1.00 P.M.

The regular routine clinics of the Infirmary will be in full operation, and many special cases will be present in the following departments:

Operative Dental Clinic. Dr. William Z. Hill in charge.

Orthodontia Clinic. Dr. Frank A. Delabarre in charge.

Extracting Clinic. Dr. William A. Goble in charge.
Radiographic and Photographic Clinic. Dr. Albert Kinley, Jr., in charge.

Research Laboratory. Dr. Percy Howe in charge.

JUNE 6, 1916.

ANNUAL MEETING OF THE SUPERVISORS.
FOYER, COPLEY-PLAZA HOTEL.
11.30 O'CLOCK.

JUNE 6, 1916.

TUESDAY NOON.
FOYER, COPLEY-PLAZA HOTEL.
ANNUAL MEETING OF THE COUNCIL.

JUNE 6, 1916.

TUESDAY AFTERNOON.
MEETING OF THE SECTION OF MEDICINE.
FOYER, COPLEY-PLAZA HOTEL.
2.30 O'CLOCK.

Officers of the Section of Medicine:

DR. HENRY JACKSON, Boston, *Chairman.*

DR. F. GORHAM BRIGHAM, Boston, *Secretary.*
(Program arranged by officers of section.)

DIABETES.

1. Results Obtained in the Treatment of Diabetic Cases, May 1, 1915, to May 1, 1916.—Dr. Elliott P. Joslin, Boston.
2. Definition and Determination of Acidosis in Diabetes Mellitus.—Dr. Albert A. Hornor, Boston.
3. Observations on the Blood Sugar in Diabetes Mellitus.—Dr. Orville F. Rogers, Jr., Boston.

Discussion:—Dr. Harry W. Goodall, Boston; Dr. Walter R. Bloor, Boston.

NEPHRITIS.

1. Tests of Renal Function from the Standpoint of the General Practitioner.—Dr. Francis W. Peabody, Boston.
2. Eye Changes in Renal Diseases, Their Diagnostic and Prognostic Value.—Dr. Peter Hunter Thompson, Boston.

Discussion:—Dr. Channing Frothingham, Jr., Boston; Dr. Reginald Fitz, Boston; Dr. George S. Derby, Boston; Dr. George Van Ness Dearborn, Boston.

JUNE 6, 1916.

TUESDAY AFTERNOON.
MEETING OF THE SECTION OF SURGERY.
STATE DINING ROOM, COPLEY-PLAZA HOTEL.
2.30 O'CLOCK.

Officers of the Section of Surgery:

DR. CHARLES E. DURANT, Haverhill, *Chairman.*

DR. WALTER M. BOOTHBY, Boston, *Secretary.*
(Program arranged by officers of section.)

SYMPOSIUM ON FRACTURES.

1. Fractures of the Base of the Skull.—Dr. Harvey Cushing, Boston.
2. The Importance of Early Reduction of Fractures with Displacement.—Dr. William Darrach, New York City.
3. The Treatment of Hip Fractures.—Dr. Frederic J. Cotton, Boston.
4. Certain Facts Concerning the Operative Treatment of Fractures of the Patella. (With lantern slides.)—Dr. Charles L. Scudder, Boston, and Dr. R. H. Miller, Boston.
5. Some Aspects of the Treatment of Compound Fractures Under Civil and Military Conditions.—Dr. David Cheever, Boston.

Discussion:—Dr. Robert W. Lovett, Boston; Dr. John Baptist Blake, Boston; Dr. John Homans, Boston.

JUNE 6, 1916.

TUESDAY AFTERNOON.
MEETING OF THE SECTION OF TUBERCULOSIS.
BALLROOM, COPLEY-PLAZA HOTEL.
2.30 O'CLOCK.

Officers of the Section of Tuberculosis:

DR. ALBERT C. GETCHELL, Worcester, *Chairman.*

DR. JOHN B. HAWES, 2d, Boston, *Secretary.*
(Program arranged by officers of section.)

1. Tuberculosis and Syphilis.—Dr. James A. Lyon, Rutland State Sanatorium.

Discussion:—Dr. W. A. Hinton, Cambridge, Dr. C. Morton Smith, Boston; Dr. R. I. Lee, Cambridge.

2. Tuberculosis Carriers.—Dr. Charles E. Perry, Hampshire County Sanatorium, Haydenville.

Discussion:—Dr. A. K. Stone, Boston; Dr. Adam S. MacKnight, Fall River; Dr. Charles J. Downey, Springfield.

3. What Constitutes Clinical Tuberculosis in Adults.—Dr. George L. Schadt, Springfield.

Discussion:—Dr. Sumner H. Remick, New Bedford; Dr. Cleaveland Floyd, Boston; Dr. Henry D. Chadwick, Westfield State Sanatorium.

JUNE 6, 1916.

TUESDAY EVENING.
THE SHATTUCK LECTURE.
FOYER, COPLEY-PLAZA HOTEL.
8 O'CLOCK.

By DR. THEODORE C. JANEWAY, Baltimore.

Subject: "The Etiology of the Diseases of the Circulatory System."

At the close of the lecture there will be music and refreshments.

JUNE 7, 1916.

WEDNESDAY MORNING.
ONE HUNDRED AND THIRTY-FIFTH ANNIVERSARY.
FOYER, COPLEY-PLAZA HOTEL.
9.30 O'CLOCK.

Business of the Annual Meeting.

PROPOSED AMENDMENTS TO THE BY-LAWS, WHICH HAVE BEEN SUBMITTED TO THE COUNCIL.

Section 1 of Chapter II shall be amended by transposing the words "unless otherwise ordered by the Council," in the second and third lines of the said Section, and by omitting all of the text after the word "June," in the fourth line, so that the Section, as amended, will read as follows:

The annual meetings of the Society shall be held, unless otherwise ordered by the Council, in Boston, on the second Wednesday in June.

Chapter IV, Section 1.

In the second line, after the word "president" insert the word "ex-presidents," and in the third line omit the word "and," and after the word "treasurer" insert the words "and librarian," so that the section shall read as follows:

Section 1. The Council shall consist of councilors chosen by the district societies, and the president, ex-presidents, vice-presidents *ex officio*, secretary, treasurer and librarian of the general society, and the chairman of each standing committee.

Chapter VII, Section 3, that the word "June" in the last line of the fourth paragraph be changed to "March"; so that the clause shall read:

This dividend shall be apportioned among the district societies according to the number of annual assessments which shall have been paid to the district treasurers previous to March first.

(Literary Program arranged by the Sub-Committee on Scientific Papers of the Standing Committee on Publications and Scientific Papers, Dr. J. S. Stone, Boston, and Dr. F. T. Lord, Boston.)

The papers will be devoted to the following topics, viewed from the standpoint of Public Health and Preventive Medicine:

1. The Relation of the State Department of Health to the Communicable Diseases of Childhood.—Dr. A. J. McLaughlin, Boston.
2. Measles.—Dr. E. H. Place, Boston.
3. Scarlet Fever (illustrated with lantern slides).—Dr. F. B. Mallory, Boston.
4. Scarlet Fever.—Dr. C. V. Chapin, Providence, R. I.
5. Diphtheria.—Dr. J. S. Hitchcock, Northampton.
6. Diphtheria.—Dr. W. H. Park, New York City.
7. Whooping Cough.—Dr. J. L. Morse, Boston.

WEDNESDAY NOON.

THE ANNUAL DISCOURSE WILL BE DELIVERED BY
DR. DAVID L. EDSALL, Boston.

JUNE 7, 1916.

WEDNESDAY AFTERNOON.

COMBINED MEETING OF THE SECTIONS OF
MEDICINE AND SURGERY.

AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL,
697 HUNTINGTON AVENUE, BOSTON.

2.30 O'CLOCK.

Chairmen: DR. CHARLES E. DURANT, Haverhill; DR. HENRY JACKSON, Boston.
Secretaries: DR. F. GORHAM BRIGHAM, Boston; DR. WALTER M. BOOTHBY, Boston.
(Program arranged by the officers of the sections.)

SYMPOSIUM ON GOITRE.

1. Medical Treatment of Goitre.—Dr. David L. Edsall, Boston.
2. Surgical Treatment of Goitre.—Dr. C. A. Porter, Boston.
3. Recent Advances in Our Knowledge of the Active Constituent in the Thyroid; Its Chemical Nature and Function.—Dr. Edward C. Kendall, Rochester, Minn.
4. Some Recent Experimental Work on the Thyroid Gland.—Dr. Walter B. Cannon, Boston.
5. Metabolism Studies of Thyroid Cases.—Dr. Walter M. Boothby, Boston.

Discussion:—Dr. Frank H. Lahey, Boston; Dr. Malcolm Seymour, Boston.

JUNE 7, 1916.

WEDNESDAY EVENING.

7 O'CLOCK.

THE ANNUAL DINNER will be served in the BALL-ROOM of the Copley-Plaza Hotel, promptly at 7 o'clock. Dress suits not necessary.

DINNER TICKETS.

Tickets for the Annual Dinner at one dollar apiece may be obtained at the Bureau of Information during the two days of the meeting by those Fellows whose current dues are paid up.

NOMINATING COMMITTEE FOR 1916-1917.

The following is the nominating committee elected by the eighteen District Medical Societies at their annual meetings during April and May, 1916. Their duty is to nominate officers and orator at the annual meeting of the Council, June 6.

District	Principal	Alternate
BARNSTABLE	E. E. HAYES	C. W. MILLIKEN
BERKSHIRE	J. H. RULEY	E. W. MARKHAM
BRISTOL NORTH	F. A. HUBBARD	R. D. DEAN
BRISTOL SOUTH	A. H. MANDELL	R. W. JACKSON
ESSEX NORTH	F. W. SNOW	R. V. BARETEL
ESSEX SOUTH	G. M. KLINE	BUTLER METZGER
FRANKLIN	G. P. TWITCHELL	
HAMPSHIRE	J. M. BIRNIE	H. W. VANALLEN
MIDDLESEX EAST	O. W. COBB	J. S. HITCHCOCK
MIDDLESEX NORTH	E. C. FISH	
MIDDLESEX SOUTH	J. J. MCCARTY	J. H. LAMBERT
NORFOLK	E. H. STEVENS	C. T. WARNER
NORFOLK SOUTH	T. J. MORPHIT	A. N. BRIGHTON
PLYMOUTH	J. C. FRASER	C. S. ADAMS
SUFFOLK	A. E. PAINE	F. G. WHEATLEY
WORCESTER	G. W. W. BREWSTER	A. L. CHUTE
WORCESTER NORTH	DAVID HARROWEN	J. T. DUGGAN
	A. P. MASON	E. L. FISKE

Correspondence.

NAPOLEON'S WOUNDS.

BOSTON, MASS., May 12, 1916.

Mr. Editor:

In the JOURNAL of Apr. 20, 1916, the following statement appears:

"The only wound that Napoleon ever received was treated by Larrey, and this was not a battle wound, properly speaking, but was due to a kick on the instep from his own horse. This was not even serious."

Compare, however, *Les Trois Blessures de Napoléon* (Esculap, Paris, 1913, iii, p. 228), which in its preface says (translated): "In a study on the health of Napoleon which he published recently in *La Chronique Médicale*, Mr. George Barral makes allusion in these terms to the wounds which the great Captain received in war: 'It is certain that he was hit, by bayonet blows, by sabre blows, and by missiles from fire-arms, more often than is commonly believed and said. When they embalmed him they were astonished to discover on his thighs, his legs, his heels, the marks of numerous injuries.'"

Since the reference therein made is now inaccessible. I looked into the most obvious volumes and readily found the following: "Napoleon showed me the marks of two wounds; one a very deep cicatrix above the left knee, which he said he had received in his first campaign in Italy, and was of so serious a nature, that the surgeons were in doubt whether it might not be ultimately necessary to amputate. He observed that when he was wounded, it was always kept a secret, in order not to discourage the soldiers. The other was on the toe, and had been received at

Eckmühl." ("Napoleon at St. Helena," by Barry E. O'Meara, New York, 1889, I, pp. 198-199.) "I asked him about a wound of which there was a deep mark in the inside of the left thigh, a little above the knee; he said it was from a bayonet." ("Napoleon at St. Helena," by Barry E. O'Meara, New York, 1889, II, p. 229.) "While he was dressing, he put his hand on his left thigh, where there was a deep scar. He called my attention to it by laying his finger in it; and finding that I did not understand what it was, he told me that it was the mark of a bayonet-wound by which he had nearly lost his limb at the siege of Toulon. . . . The Emperor, on this, observed that people had in general wondered and talked a great deal of the singular good fortune which had preserved him, as it were, invulnerable in so many battles. 'They were mistaken,' added he; 'the only reason was, that I always made a secret of all my dangers.'" ("Journal of the Private Life and Conversations of the Emperor Napoleon at St. Helena," by the Count de Les Cases, London, 1824, I, Part 2, p. 67.)

If I, inexperienced, and within two hours, could find the above, it seems probable that overwhelming evidence against the statements first quoted, could be adduced by someone familiar with any large part of the more than 80,000 items in the Napoleon bibliography.

Yours very truly,

ALFRED ELA, M.D.

CAESAREAN SECTION AGAIN.

Boston, Mass., May 12, 1916.

Mr. Editor:

I do not wish to weary your readers with a prolongation of the controversy which has risen between Dr. Kellogg and myself with regard to Caesarean Section, but I do wish to call attention briefly to two points in his recent letter.

First: Dr. Kellogg states that he has been unable to see the bearing of experimental work on animals upon similar conditions in human beings. This argument has long been used by the Anti-Vivisectionists. For refutation I refer the reader to numerous articles in this JOURNAL during recent years.

Second: My critic makes the statement that the repair of child-birth injury is not difficult surgery. This is a common and pernicious fallacy. The gynecological clinics of Boston all contain some patients in whom repair of such injury has been unsuccessful, even at the hands of master gynecologists.

Very respectfully yours,

JOHN T. WILLIAMS, M.D.

Miscellany.

SOCIETY NOTICE.

The eleventh annual meeting of the New England Alumni of the University of Maryland School of Medicine, comprising the alumni of the University of Maryland School of Medicine, the Baltimore Medical College and the College of Physicians and Surgeons of Baltimore, will be held at Young's Hotel, Tuesday evening, June 6, at 5.30 P.M., banquet at 6.30 P.M.

A. LAWRENCE MINER, M.D., *President*.

Bellows Falls, Vt.

C. S. Gilman, M.D., *Secretary*.

45 Bay State Road, Boston.

APPOINTMENTS.

Henry C. Marble, M.D., of Boston, has been commissioned as First Lieutenant, Medical Corps, M.V.M., and is assigned to the Fifth Regiment Infantry.

Richard H. Miller, M.D., of Boston, has been commissioned First Lieutenant, Medical Corps, M.V.M., and is assigned to the First Regiment Field Artillery.

RECENT DEATHS.

DR. JOHN FRANCIS HANAFIN, a Fellow of The Massachusetts Medical Society, died of pulmonary tuberculosis at Saranac, N. Y., May 7, aged 30 years. He was a native of South Hadley Falls, and was educated in Belchertown and at Yale College, taking his M.D. from the College of Physicians and Surgeons, Baltimore in 1911. He practised in Holyoke.

DR. LOUIS J. PHELAN, who died on May 7 at Paris, France, had been engaged on Red Cross work in that city. He was a graduate of the Medical College of the University of California.

DR. WILLIAM MURRILL BULLARD, who died of heart disease on May 12, at Brooklyn, N. Y., was born in 1840. After graduating from Amherst College, he studied medicine at the University of Goettingen. He had practised his profession in Brooklyn for many years.

DR. RICHARD STEIN, who died at New York recently, was born in Germany in 1860, and received his medical education at the University of Heidelberg. He had practised his profession in New York for a number of years.

DR. HENRIK GREVE BLESSING of Copenhagen died at Christiania, Norway, on May 22. He is remembered chiefly as physician to the Nansen Polar Expedition of 1893-96.

DR. CHARLES AUGUSTUS WHEATON, who died on April 29 at St. Paul, Minn., was born in Syracuse, N. Y., on March 17, 1853. He received the degree of M.D. in 1877 from the Harvard Medical School.

DR. LUTHER M. FERGUSON, who died on May 22 at Washington, D. C., was born in Chin Kiang, China, on July 2, 1888, the son of a missionary surgeon. After attending the Cantonal College at Lausanne, Switzerland, he returned to the United States and entered Phillips Andover Academy from which he graduated in 1906. He received the degree of A.B. from Harvard College in 1910 and that of M.D. in 1915. In 1913 and 1914 he served as surgical house officer at the Massachusetts General Hospital and subsequently was admitted to the United States Army Medical Reserve Corps. He then entered the United States Army Medical College from which he had but recently graduated and had been appointed assistant surgeon and first lieutenant in the active medical corps. He had just been detailed to the Walter Reed Hospital for service. He is survived by his widow.

DR. FRANK PARKER TAYS LOGAN, of Gloucester, Mass., was found dead on the floor of his office, May 26. He was born at Columbus, Texas, October 16, 1866, and was a graduate of Harvard Medical School in 1897. In this year he joined the Massachusetts Medical Society and settled in Gloucester, where he had practised since. He specialized in tuberculosis, was a member of the staff of the Addison Gilbert Hospital, and during the Spanish War was first lieutenant and assistant surgeon to the 8th Mass. Volunteers. He was a member of the Association of Military Surgeons, U. S., of the American Medical Association and of the Gloucester Medical Club.

DR. EDWIN WILBUR HIGBEE, aged 66, died May 21, at his home in Northampton, Mass., after being in failing health for some time. He was born in Charlotte, Vt., and obtained his professional education at the medical school of the University of Vermont. After graduation he first practised in Westfield, and then in Springfield. After the retirement of his uncle, the late Dr. E. B. Harding of Northampton, Dr. Higbee succeeded to his practice. He was never a Fellow of the Massachusetts Medical Society. Dr. Higbee is survived by his widow and one son.

The Boston Medical and Surgical Journal

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CHOLECYSTITIS; CHANGES PRODUCED BY THE REMOVAL OF THE GALL-BLADDER.*

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PATHOGENESIS.

THE etiology of cholecystitis possesses many phases of which we have no definite knowledge. We all agree that non-neoplastic surgical diseases of the biliary tract are the result of bacterial infection. There may be one exception to this statement: Archibald¹ contends, and many of us believe that pancreatitis is often if not always due to chemical changes in the pancreas. It was formerly supposed that infection in the gall-bladder was secondary to that in the biliary ducts; that infection in the ducts was more prone to subside, while that in the gall-bladder would persist.

Stagnation of bile in the gall-bladder is thought to be the main predisposing cause of cholecystitis. Bacteriologic study of the bile and the contents of the gall-bladder of patients operated on for the removal of stones, has shown sterile cultures in more than 50%, according to several investigators (Deaver²). Attention has been called to the fact that many patients are operated on as a result of the infection rather than because of active infection and, on this account, figures may give an erroneous impression.

Several investigators have found organisms in the calculi when the bile was sterile.

There are many avenues through which bacteria may reach the biliary ducts and gall-bladder. A great deal has been said about their entrance by way of the portal circulation and through the liver and hepatic duct. It seems to me there can be no question but that infection of the bile passages may and does, at times, take place in this manner. It has also been proved that bacteria may pass from duodenum through the ampulla into the common duct and thence through the cystic duct into the gall-bladder. However, the duodenum normally is almost free from bacteria, and infection through this channel probably does not occur as often as we formerly supposed. The frequency of the coexistence of an ulcer of the duodenum and cholecystitis is well known. Does it not seem probable that in these cases cholecystitis is a secondary infection caused by organisms from the ulcerated area in the duodenum which have reached the gall-bladder through the common duct? According to Rosenow, it must be borne in mind that before an infection entering through the lumen of the cystic duct can reach the tissues of the gall-bladder, it must penetrate the lining mucous membrane, which, like similar structures in other viscera, was probably intended to resist just such an invasion. This is well illustrated in the urinary bladder, for often a markedly infected kidney will pour infected urine into the bladder for a long time before there is any evidence of infection in the bladder itself. It should be recognized, however, that infection from either the liver or the

* Read before the Suffolk District Medical Society, Mar. 8, 1916.

duodenum may enter the gall-bladder by way of the common duct. Does it not seem probable that these organisms, especially in the presence of stagnant bile, become foci for stone-formation without necessarily producing an infection in the wall of the gall-bladder?

The important and most valuable work of Rosenow³ has not only renewed our interest in the systemic circulation as a possible route for most of those infections, but it also had a tendency to change our methods of procedure in the treatment of these cases. We know that in a large percentage of these patients, the infection is really in the wall of the gall-bladder and that it reaches the tissues through the blood vessels. Rosenow has produced similar lesions in animals and has demonstrated the selective action of the bacteria. The organisms with which his results were obtained were mainly isolated from the involved tissues or from the lymph-glands draining the infected area. Twelve strains isolated from the tissues of patients who had cholecystitis produced lesions of the gall-bladder in 80% of 41 animals injected. Contrast this with the average of only 11% which was obtained with the other strains. I do not believe the importance of the systemic circulation as an avenue of infection was recognized formerly. It will be readily seen that if the infection is in the bile only, the removal of the stones and drainage will be quite sufficient, while if the disease is in the tissues of the gall-bladder, drainage will afford relief only temporarily unless the infection is slight.

It is difficult to recognize all cases of cholecystitis even when the abdomen is open so the gall-bladder can be seen and felt. The normal gall-bladder is primarily soft and collapsible, though it is often so tense and firm that we are unable to empty it. I have noticed this condition a great many times in cases in which there was no other suggestion of inflammation. The color of the gall-bladder, the consistency of the bile, the appearance and thickness of the mucous membrane, all help in making a diagnosis of cholecystitis. C. H. Mayo⁴ has called attention to the enlargement of the regional lymphatics as a most important factor in determining the presence of inflammation in the gall-bladder, if there is no evidence of ulceration in the duodenum. Hard, nodular enlargement of the head of the pancreas has been noted in conjunction with the enlargement of the lymphatic glands. In many of these cases the clinical history may be the chief factor in determining the diagnosis, other gross lesions, such as ulcer and inflammation of the appendix, having been excluded.

Interval attacks are not nearly so pronounced in cases of chronic cholecystitis when there is considerable inflammation of the gall-bladder, as in cases in which stones in the gall-bladder appear to be the main factor and there is little infection in the tissues. It is essential to recog-

nize the fact at operation that the inflammation in the gall-bladder may have almost subsided, and we are obliged to depend a great deal on the clinical history. Usually it is not a good plan to base operative procedures on clinical history unless it is supplemented by pathologic findings. However, in some of these cases of cholecystitis in which the pathology is not very definite and the clinical history is clear, we are obliged to base our operation, to a certain extent, on the clinical history unless we are able to find something else that will explain the symptoms. To illustrate this point I may say that I recall a number of patients whose histories were typical of gall-bladder disease and on exploration no calculi or recognizable inflammation of the gall-bladder were found. However, these patients continued to have symptoms and after some months, or possibly several years, a second operation was performed and a definite cholecystitis, possibly with stone formation, was found. This seems to indicate that cholecystitis existed at the time of the exploratory operation, though it was not recognizable. Acute and chronic catarrhal conditions produce great thickening and edema of the walls of the gall-bladder. Due to the fine, white lines on the mucous membrane, chronic catarrhal or strawberry cholecystitis may frequently be recognized before the gall-bladder is opened, though a definite diagnosis cannot often be made until it is opened.

Malignant disease of the gall-bladder occurs rarely, though in our clinic, as pointed out by C. H. and W. J. Mayo,⁵ it has always been associated with gall-stone formation. During the past year I operated on a man for recurring symptoms of gall-bladder disease. He had been operated on nine years previously at another clinic and stated that a great many stones were removed at that time. He had remained entirely well until a few months before consulting us, when there was a return of former symptoms. On exploration I found a very thick-walled gall-bladder, the induration extending to the ducts and the surface of the liver. I removed the gall-bladder, which proved to be malignant. No trace of stones either in the gall-bladder or ducts could be found. The patient had never been jaundiced. He died about three months after returning home.

Empyema of the gall-bladder, either acute or chronic, is easily recognized. The walls are thick, there is much fibrous tissue, and often complete destruction of the mucous membrane. The treatment of this condition is still a debatable question. I believe, however, that most surgeons feel there will be less mortality, all factors considered, if the gall-bladder is removed. In certain cases it will seem advisable to do the operation in two stages.

Much has been said about chronic catarrhal cholecystitis in which the mucous membrane has the appearance of a ripe strawberry (MacCarty⁶). The principal change, grossly, consists

of the erosion of the apices. These desquamations present themselves as yellow specks scattered throughout the mucosa. Often there are no stones present, though the fine, white specks observed on the mucous membrane have frequently been mistaken for cholesterol stones. At our clinic in the year 1913 we operated on 21 patients who had strawberry gall-bladders with no evidence of stone formation. The appendix was removed as a secondary operation in most of these, but chronic cholecystitis was the chief pathologic lesion. In nearly every instance the symptoms were those produced by inflammation of the gall-bladder. I have recently traced them by letter, and 12 of the 21 report that they are entirely well and relieved of all symptoms; 5 report that they are greatly relieved, though not entirely well; 3 report no improvement, and 1 says he is worse. The removal of the gall-bladder practically cured 17 of the 21 patients. This type of cholecystitis is often found at autopsy on persons who seem to have had few, if any, symptoms due to the inflammation; similarly, some years ago, the so-called "innocent" gall-stones were found. In reviewing the records of 577 autopsies in our clinic on persons dying from other causes, I found 26 cases in which the pathologist had reported a chronic catarrhal condition of the gall-bladder of the strawberry type, though a recognizable clinical history of gall-bladder trouble had not been obtained. This means that the condition which caused death offset the symptoms of chronic cholecystitis. In all probability evidence pointing to the inflammation in the gall-bladder would have been obtained in a more carefully taken general history. It certainly would have been discovered if the more important lesions which caused death had not been present. This also suggests that a certain degree of chronic cholecystitis may exist without producing much evidence of trouble.

THE FUNCTION OF THE GALL-BLADDER AND THE EFFECTS OF ITS REMOVAL.

The exact function of the gall-bladder has never been definitely established. It is most often spoken of as the reservoir for bile. However, this theory has been questioned by many investigators since this comparatively small diverticulum which holds at most only a few ounces, would seem inadequate, if we consider the normal output of bile from 30 to 50 ounces in 24 hours. C. H. Mayo and Deaver are of the opinion that the gall-bladder acts as a tension-bulb and that during fluctuations of pressure in the ducts, the gall-bladder may spare the parenchyma cells of the liver from back pressure. These fluctuations of pressure probably occur as a normal consequence of digestion, or they may be due to pathologic changes—an increase or decrease in the secretory power of the liver cells. The physiologists tell us that the secretion of bile is continuous, but that its output

into the duodenum is not constant and coincides exactly with the period of digestion in which acid chyme is spurted in rhythmic jets from the stomach into the duodenum. They say that bile secreted by the liver in the interval must collect in the gall-bladder, where it is condensed through the absorption of water. Flexner⁷ has shown that if mucus from the gall-bladder is mixed with the bile, it is very much less irritating to the pancreas.

Since so many surgeons consider cholecystectomy the operation of choice, it is interesting and important to know just what changes take place after the removal of the gall-bladder. We have much evidence to show that man may exist very comfortably and apparently indefinitely without a gall-bladder. Some months ago at my request Mann and Sistrunk* removed the gall-bladders from a number of dogs. The wounds were closed with catgut and for that reason some of the animals were lost shortly after operation. The dogs which survived have been studied at various intervals. Twelve of the first series of animals lived more than 30 days; 10 of the 12 at autopsy showed dilatation of the common, hepatic or cystic duct. In some instances the cystic duct was not dilated, apparently because it had been ligated very close to the common duct. None of these animals seemed to be inconvenienced by the removal of the gall-bladder. Some of them died very shortly after operation but apparently the removal of the gall-bladder had nothing to do with the cause of death. A careful examination of the animals that lived only a short time, did not reveal any changes in the ducts, liver or pancreas, while all the dogs that lived more than 60 days, at autopsy showed some dilatation of the common duct. There was considerable variation in the amount of dilatation, though the duct was usually two or three times its normal size. Dilatation seemed to be greatest in the hepatic duct; however, it invariably stopped at the surface of the liver, and in none of the animals was there any enlargement of the ducts within the tissues of the liver, nor was there any macroscopic or microscopic change in the liver, the pancreas or the pancreatic ducts, in the several instances in which these organs were examined. The pancreatic ducts did not show dilatation. Unquestionably, dilatation of the ducts is at least partly due to the pressure caused by the resistance of the sphincter at the ampulla of Vater (Figs. 1-5). Oddi⁸ first demonstrated the presence of this sphincter; its activity has been most carefully worked out by Archibald. Although dilatation of the ducts is probably chiefly caused by the bile being held back by the constrictor muscles at the ampulla, eventually dilatation may overcome the action of this sphincter. Two dogs that had had their gall-bladders removed two months previously showed almost complete absence of sphincter action, and a cannula introduced into

* In the Laboratory of Experimental Surgery, Mayo Foundation.



FIG. 1.—Photograph of the under surface of the liver of a normal dog. The biliary tract and a segment of duodenum are distended with air.

the dilated common duct carried water through the ampulla into the duodenum with no apparent resistance. An active sphincter will resist from 300 to 600 mm. of water pressure. If we can demonstrate that the dilatation of the ducts (which follows the removal of the gall-bladder) results in paralysis or laxity of the muscle at the ampulla, the cure of inflammation of the pancreas by the removal of the gall-bladder may be explained.

The experiments of Opie⁹ and Flexner show that the injection of bile salts into the pancreatic ducts invariably produces pancreatitis. Why is it, then, that cholecystectomy is not always followed by a very severe irritation of the pancreas? If cholecystectomy is performed, the source of the mucus is removed. The mucus mixed with the bile apparently protected the pancreatic tissues. It would seem also that immediately after the removal of the gall-bladder there should be a distinct increase of pressure in the common duct and a considerable quantity of bile would be more freely forced back into the pancreatic ducts. Possibly this explains the rather severe reaction (especially vomiting of bile and quick pulse) which sometimes persists for a few days after cholecystectomy. We have known for a long time that removal of the gall-bladder cured a large percentage of cases of pancreatitis (W. J. Mayo¹⁰). After a very thor-



FIG. 2.—Photograph of the under surface of the liver of a dog of approximately the same size and weight as in Fig. 1; the gall-bladder had been removed 214 days previously. Marked dilatation of the common and hepatic ducts.

ough experimentation and clinical study, Archibald concludes that nearly all cases of pancreatitis are due to irritation of the pancreas as the result of bile entering the pancreatic ducts, in other words, that pancreatitis is caused by chemical changes rather than bacterial. The cure of pancreatitis which has been produced in this way would necessarily lie in the paralysis of the Oddi sphincter. This would allow the bile to flow into the duodenum unobstructed.

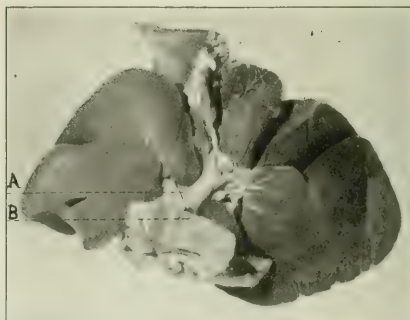


FIG. 3.—Photograph of the under surface of the liver of a dog from which the gall-bladder had been removed 122 days previously, showing distended gall ducts.

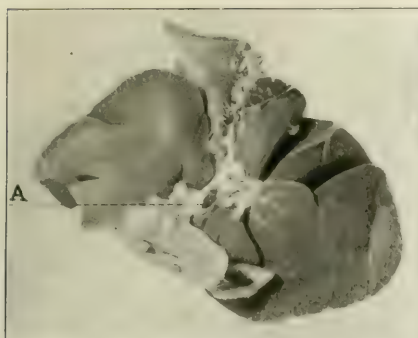


FIG. 4. Photograph of the same specimen as in Fig. 3, gall ducts opened showing the accumulation of stones, which apparently had caused the dog no inconvenience. No evidence of stones at the time of cholecystectomy.

Archibald suggests an operation which he has performed experimentally to paralyze this sphincter. From our experiments we feel sure that the dilatation of the common duct which always follows cholecystectomy will eventually result in a paralysis of the sphincter, that the bile will flow into the duodenum with little or no back pressure; and the symptoms produced by irritation to the pancreatic tissues will be entirely relieved. We are endeavoring to produce paralysis of this sphincter at the time the gall-bladders are removed from animals, and in this way we try to show that the dilatation which follows is the result of sphincter action.

Dilatation of the common duct following removal of the gall-bladder is frequently seen at

the operating table. However, it is often complicated by stones in the common duct. I have often observed this condition in patients having hydrops of the gall-bladder, and as the stone obstructs the common duct, the organ is out of commission. Often patients have not given a history of having had a stone or infection in the common duct, and at operation the duct is found markedly dilated but free from stone. A similar condition is also observed in cases of very marked cholecystitis in which the infection is so extensive that in all probability the gall-bladder has ceased to functionate. For a long time it has been known that the dilatation of the ducts called "compensatory dilatation" does result from the removal of the gall-bladder. Oddi and Rost¹¹ have called especial attention to the condition.

If the pancreatitis which results in some of these cases is due to lymphangitis, as suggested by Deaver and Pfeiffer,¹² the removal of the gall-bladder would also cure this condition, because in most instances unquestionably the primary infection is in the gall-bladder, and from it extends along the lymphatics of the ducts and then into the glands throughout the pancreatic lobules. The two cases following serve to illustrate the changes to be expected after cholecystectomy:

CASE (A-145,438) Mrs. J. B., 56 years of age, a housewife living on a farm, was examined Nov. 10, 1915. Family history negative. There had been no previous diseases, injuries or operations. Her chief complaint was nausea, vomiting and pain in the abdomen. She was very weak, unable to walk, and came to the clinic in a wheel-chair. While her history was being taken, she vomited several times.

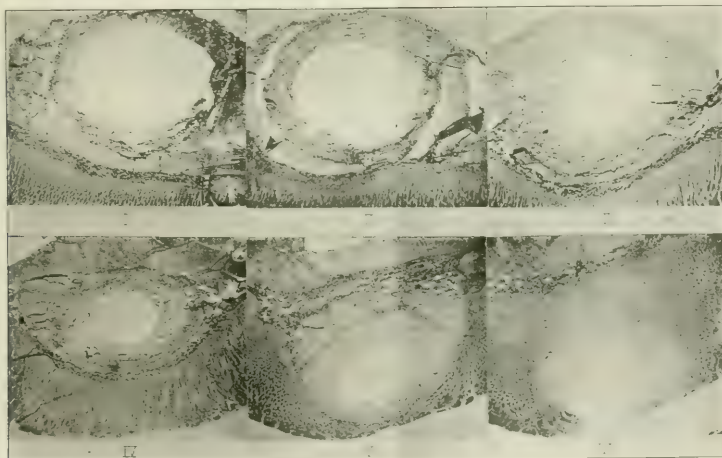


FIG. 5.—Photomicrographs of cross sections of the different parts of the common bile duct. No. I is a section through the duct just at its entrance into the duodenal wall. Nos. II, III, IV show the different intramural portions of the duct. Nos. V and VI show the passage of the duct through the mucosa. Note the change in the size of the lumen, the variation in the amount of muscle surrounding the duct, and its relation to the duodenal mucosa.

Her husband stated that the vomiting had begun suddenly and had persisted since August, with much bile in the vomitus and general abdominal pain. She had been able to drink some water and thought that this had preserved her. She was markedly emaciated and prostrated. Examination of the chest and pelvis was negative. Reflexes were normal; skin dry; throat parched; tongue red; peristalsis visible, and also noticeable on palpation.

It was apparent that the woman was suffering from chronic obstruction, most likely in the intestines, though we were unable to say definitely that it was not gastric. On account of her weakened condition, no further examinations were made and it seemed best to do an immediate exploration. A right rectus incision was made Nov. 15, 1915. The gall-bladder was markedly dilated; there was considerable dilatation of the common duct, though no stones could be felt. The obstruction was caused by intussusception in the small intestine, beginning about five feet from the duodeno-jejunal juncture. It was impossible to reduce the intussuscepted loop

and we did a resection, removing about three feet of the small intestine. The end of the bowel was closed and an end-to-end anastomosis made. The patient did not rally from the operation and died in 24 hours.

Autopsy revealed an interesting condition of the gall-bladder. It was markedly distended, and upon opening we found chronic cholecystitis of the strawberry type and papilloma. It was filled with a dirty, tenacious, bile-stained mucus. The gall ducts were also markedly distended; the hepatic duct 2 cm. in diameter, the common duct 1 cm., and the cystic duct 1 cm. At a point 3 cm. from the gall-bladder, the cystic duct was obstructed by a ring of inflammatory, fibrous tissue which had contracted around it. A probe could not be passed through the duct from below upward or from above downward, neither could fluid be forced through it. Aside from this stricture the ducts were patent. No stones or inspissated bile were found in the ducts. The liver was slightly enlarged; the bile ducts were filled with mucus; the pancreas negative (Fig. 6).

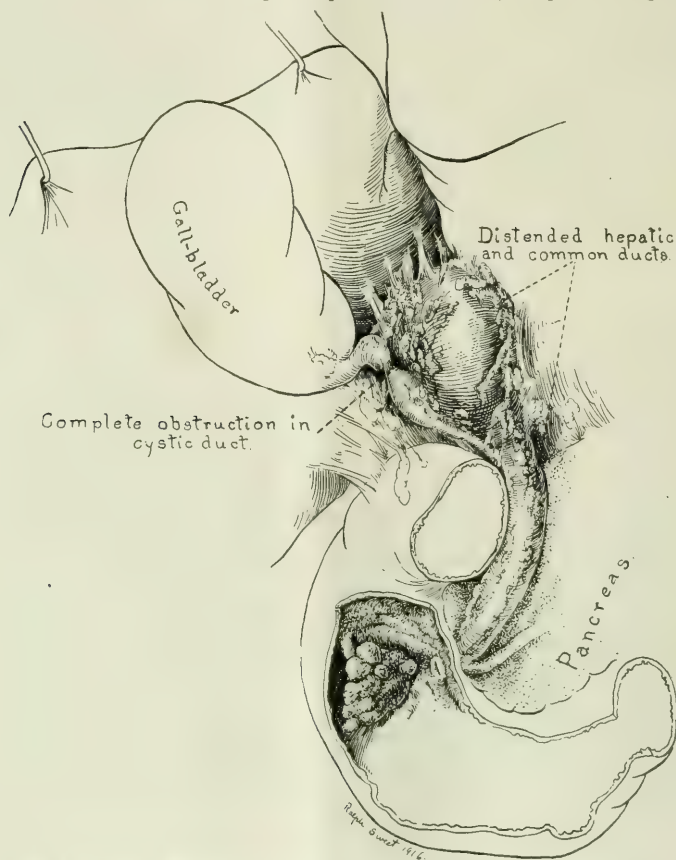


FIG. 6. (A145,454.)—Specimen removed at autopsy. Complete closure of the cystic duct, evidently of long-standing. Common duct dilated to 12 mm. in diameter. Stricture of the cystic duct has produced a condition similar to that following the removal of the gall-bladder.

We were unable to elicit a gall-bladder history from either the patient or her husband, and believe that the nausea and vomiting were due to the intestinal obstruction. Of course, we could not say whether or not she had had gall-stones that had passed. Our interpretation of the features in this condition of the gall-bladder was that from some cause, the cystic duct had been obstructed and this had eventually destroyed the mucous membrane, leaving a stricture, with the result that the gall-bladder could no longer perform its functions, and the condition was the same as though the gall-bladder had been removed. Marked dilatation of the common duct had taken place, which, as is shown in the drawings, was probably secondary to occlusion of the gall-bladder from the biliary tract.

CASE (A-92,877) T. H., a business man, 64 years of age, was examined Sept. 29, 1913. Family history negative. This patient had had gastric symptoms off and on for 20 years, and recently he had had typical gall-bladder attacks. On Oct. 30, 1913, cholecystectomy was done. Four stones as large as pullets' eggs and three small ones were removed from the gall-bladder and from a pocket in the liver into which they had perforated. The adherent omentum in an umbilical hernia was also resected and one piece was sutured into the sac to plug the opening. Recovery was uneventful.

The patient returned, Dec. 16, 1915, giving a history of recent symptoms typical of duodenal ulcer. December 29, 1915, posterior gastro-enterostomy was performed. It was found that an ulcer of the duo-

denum had caused obstruction of the pylorus; the stomach was dilated, and there were adhesions about the pyloric end. The patient did well for six days, had no trouble with his stomach, took food freely, and was able to sit up in a chair. He had had bronchitis for several years, but apparently it was not troublesome. However, bronchial pneumonia developed rather suddenly and he died in seventy-two hours after the onset.

Autopsy Jan. 7, 1916, showed a well-healed gastro-enterostomy, no leakage; the orifice admitted two fingers. Gall ducts were patent. The common duct was dilated to 2.2 cm. in diameter; the cystic duct was not distended. Just proximal to the papilla of Vater, but apparently having no communication with it, there was a small diverticulum leading from the duodenum. The diverticulum was lined with duodenal mucous membrane, about 3 cm. deep and 1.5 cm. in diameter. The pancreas was rather firm and nodular to the touch and showed chronic pancreatitis (Fig. 7).

This case gave us an opportunity to observe the condition of the gall ducts two years after cholecystectomy, which really amounted to a cholecystectomy, as the gall-bladder was practically destroyed at the time of the drainage operation. The gall-bladder was constricted and held down by a mass of adhesions and evidently had not been functioning for a long time; the ducts were markedly dilated.

The two cases I have just cited are the only ones I could find in our autopsy records in which the gall-bladder had been either destroyed

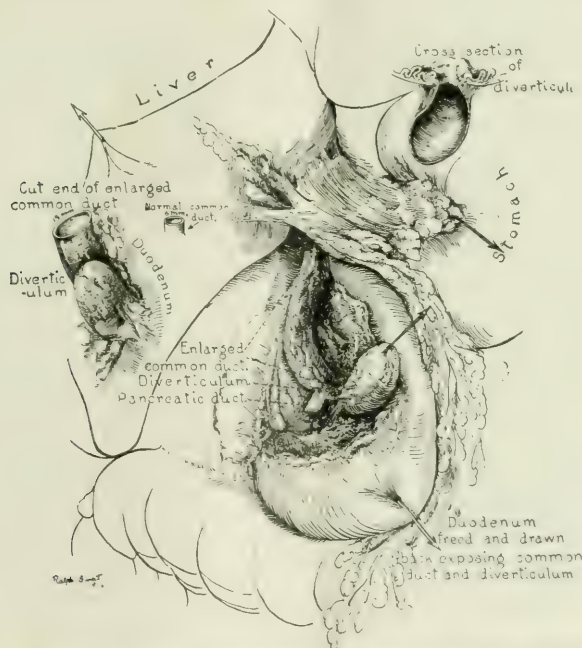


FIG. 7. (A92,877).—Specimen removed at autopsy two years after cholecystectomy. Gall-bladder entirely destroyed. Common duct markedly dilated, measuring 16 mm. Scar tissue fills space previously occupied by gall-bladder.



FIG. 8. Dotted line, old incision.
Black line, new incision.



FIG. 9. External aponeurosis of rectus muscle incised. Rectus muscle fibers separated by blunt dissection. Black line, aponeurosis incision. Dotted line, muscle incision.

or removed some time previous to the autopsy. Although the gall-bladder was not removed in either of these cases, practically that condition obtained, and the changes which took place were those that might be expected following cholecystectomy.

TECHNIC.

Cholecystectomy must be considered the operation of choice if we assume that the infection is actually in the tissues of the gall-bladder, and if we know that the removal of this organ relieves pancreatitis, whether produced through the regional lymphatics or the common and pancreatic ducts. A much larger percentage of patients have recurrences following drainage, and this would seem to be an argument in favor of cholecystectomy. C. H. Mayo's¹³ recent report shows that the mortality following the two operations is about the same. The gall-bladder can be removed without any untoward results to the patient, and the only changes following its extirpation are those in the biliary ducts. The drainage operation will have a place, at least until it has been shown that the infection is always systemic and into the tissues themselves. It seems

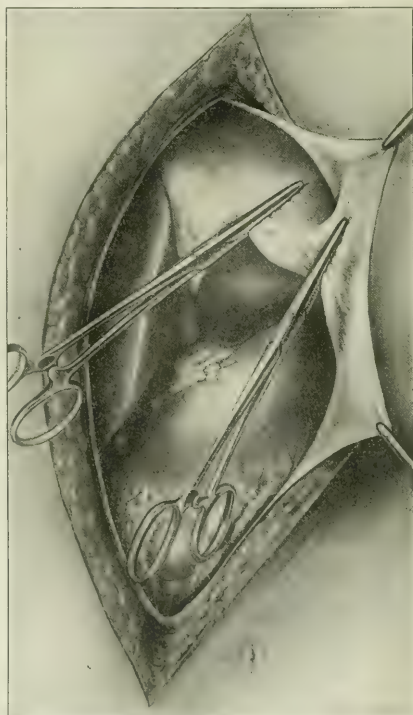


FIG. 10.—Clamps on the suspensory ligament. The ligament can be cut between clamps for better exposure.

to me that cholecystostomy would be the operation preferred in any case in which the infection seemed to be in the bile only and in which the tissues of the gall-bladder were free.

There are a few points in the technic of gall-bladder operations which I think should be emphasized. Good exposure is most essential, and this does not depend nearly so much on the size of the incision as on its location (Fig. 8). Formerly it was customary to make the incision over the fundus of the gall-bladder, but the fundus is nearly always movable and the fixed point is at its juncture with the cystic duct. The best exposure of the gall-bladder, cystic duct and common duct is obtained by making the incision in the abdominal wall at a point just over the ducts. This will be near the midline beginning directly beneath the ribs to the right of the ensiform. The best incision is the one made in a straight line through the superficial tissues and deep fascia, extending obliquely from the ensiform to a point about two inches to the right of the umbilicus. This is practically the Bevan incision. The next step is to reflect the fascia and separate the right rectus muscle fibres (Fig. 9). If there is any difficulty at all in obtaining the exposure after the peritoneum is opened, it is best to cut the suspensory ligament of the

liver. This is not always necessary, but often a great help. After the ligament has been cut, the edge of the liver turns back much more easily and the end of the ligament attached to the liver can be used as a tractor without traumatizing the tissue of the liver (Fig. 10). According to most anatomists, this ligament does not have the function of suspension. It can always be sutured or the ends tied together after the deep part of the operation is completed. In doing a cholecystectomy it is usually best to begin with the dissection of the cystic duct; with some thick-walled gall-bladders, it may be better to begin at the fundus and dissect downward (Figs. 11 and 12). Beginning at the cystic duct it is best to dissect the lower end of the gall-bladder and also the cystic duct away from the liver and common duct before clamping or tying; then the cystic duct and cystic artery can be clamped separately or at one time. In this way the control of these structures is much more accurate and there is no danger of traumatizing the common or hepatic duct.

From the foregoing the following conclusions seem indicated:

1. The systemic circulation is one of the most important, if not the most important, ave-



FIG. 11.—Suspensory ligament divided. Dissection of the cystic duct from the liver, common and hepatic ducts, the gall-bladder being held with the fingers.

nue through which infection reaches the gall-bladder.

2. With the knowledge now at our command we were unable to recognize all cases of cholecystitis, even with the abdomen open.

3. The clinical history is a most important factor in determining the existence of cholecystitis. The significance of the enlargement of the regional lymphatics and the condition of the wall of the gall-bladder is already recognized.

4. Chronic cholecystitis without stones does exist as a definite pathologic lesion, and produces symptoms that will be relieved by the removal of the gall-bladder. However, chronic cholecystitis may exist to a slight degree without producing definite symptoms.

5. The only change in the surrounding structures, produced by the removal of the gall-bladder, is the dilatation of the common and hepatic ducts, and possibly the stump of the cystic duct. Dilatation is apt to be most marked in the hepatic duct; it is least at the intestinal end of the

duct. Dilatation seems to stop where the duct passes through the muscle of the intestinal wall.

6. Eventually this dilatation, with increased pressure, overcomes the action of the sphincter at the intestinal end of the duct, and the bile passes through into the duodenum with very little resistance. We believe that this mechanism explains why the removal of the gall-bladder cures symptoms produced by inflammation of the pancreas, assuming that the inflammation in the pancreas is caused by bile from the common duct entering the pancreatic ducts.

7. The changes in the ducts which follow cholecystectomy indicate that the gall-bladder has a definite function.

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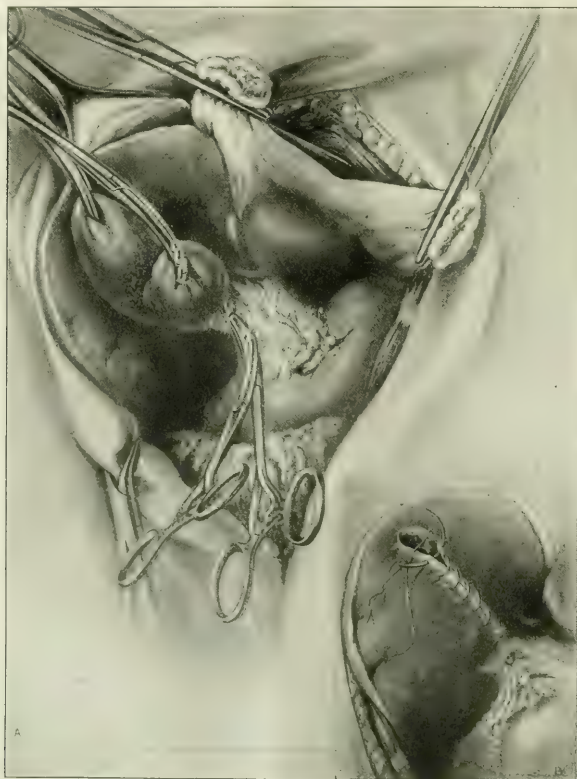


FIG. 12.—A. Cystic duct severed between clamps. Gall-bladder turned back. One clamp under the cut-off end of the gall-bladder catches any little vessels not included in the clamp on the cystic duct. B. Gall-bladder dissected out in the usual way and incision in the liver sutured.

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NEPHROPEXY.*

By R. H. GILPATRICK, M.D., BOSTON.

FROM a study of the anatomy and physiology of the kidney and of its relations and means of support, we must conclude that the organ is never a fixture. Mobility without symptoms may exist to marked degree, to be only accidentally discovered. The only primary supports for the kidney are intra-abdominal pressure, inclination of the spine so as to form a modified niche for the organ and maintained by correct posture and the attachments of the posterior kidney surface to the aponeurotic covering of the quadratus lumborum muscle. In operating for pathologically mobile kidney it is, therefore, unnecessary and also unwise to attempt a fixation or a perfect replacement of the organ in its exact anatomical position, an approach to within one inch being sufficient, safe and so much more easily accomplished as to render the accurate approximation of the decapsulated posterior surface to the lumbar fascia much more certain in each case. A kidney one inch lower than its supposedly normal level is still within its niche, and by not attempting to place it higher all danger of injury to the diaphragm is avoided.

Most commonly the ptosed kidney is a part of general enteroptosis and may be, as held by some authorities, the first step in development of that difficult and complicated condition. It is, however, a fact that many patients coming to operation for entirely dissociated conditions are found to have kidneys with great degrees of mobility without symptoms referable and lacking signs of general ptosis. From this fact it seems reasonable that an occasional uncomplicated pathologically floating kidney will be identified, and such has been our experience. Perfect end-results in a large number of nephropexies will bear a closer relation to the care and judgment of the surgeon than to any special operative technic, provided the functional

activity of the kidney is not impaired. As a rule, the development of symptoms from mobile kidney is slow, accompanied by relaxation of abdominal wall and perineum, faulty posture and lowered intra-abdominal pressure. Before surgical relief is undertaken there have frequently developed other abdominal disorders, either distinct from or secondary to the ptosis. Hence the need for discrimination before operation is advised, and for thoroughness once one enters upon that course. The wandering kidney must be considered innocent until proven guilty by a process of elimination. When proven guilty the correction of posture and increase of intra-abdominal pressure may give relief. A thin subject may also gain much help from a new deposit of fat, though in my experience this relief has been but transitory. If operation is undertaken it must result in readjustment of all faulty supports and elimination of all complicating conditions or it will not be completely satisfactory. If these conditions obtain the results will be satisfactory. So far as the nephropexy alone and the relief of symptoms rightly laid to the wandering kidney are concerned, the operative mortality and resulting percentages of cures will rank with those for repair of inguinal hernia, the two conditions offering points of analogy. The surgical problem in each is one of mechanics, the restoration of normal anatomy without interference with the physiology of the organs or tissues involved. In hernial repair the normal relations may be and generally are to some degree changed without any resulting functional disturbance, the analogous step in nephropexy being the more or less complete decapsulation of the kidney. The final strength of the hernial repair is dependent upon scar tissue forming between edges of replaced, transplanted or reconstructed tissue, while the only permanently dependable kidney support, other than intra-abdominal pressure and posture, which can be induced surgically is of the same nature, the scar formed between the posterior decapsulated surface of the kidney and the aponeurosis over the quadratus; and the strength of this agglutination of surfaces will depend upon the accuracy with which they are brought into contact, just as that of the hernial scar depends. A nephropexy which removes the wandering tendency of the kidney and results in its permanent residence at the site chosen for it, but at the expense of all or a generous portion of its functional activity, is not a success any more than the repair of an inguinal hernia which holds securely but results in atrophy of the testicle.

Moore and Corbett demonstrated in 1910 that serious damage always follows puncture, incision or constriction of the kidney, and that the relative damage done is proportionate in the order named. Constriction by a suture not only destroys the portion of substance included in it, but a wide zone on either side. Three

* Read before the Chirurgical Society of Boston, Dec. 30, 1915.

encircling sutures are sufficient to practically destroy an entire kidney, the organ so treated resembling one pathologically contracted from other causes. Decapsulation of a sound kidney is, however, not followed by permanent functional change. This is attested by numerous investigations, both clinical and experimental. Lapeyre found that 62% of his dogs showed albumin, sugar, or both, for 24 hours after decapsulation, but that it never persisted after that time, and that no other change was demonstrable. He decapsulated one kidney and did a bilateral ureterostomy and tested comparative permeability with fluorescein and potassium ferro-cyanide, also with intra-venous injections of iso- and hypertonic solutions of sodium chloride, urea and glucose. No appreciable difference ever appeared between the decapsulated and sound kidneys.

The squamous epithelium lining the kidney pelvis is very prone to overgrowth under chronic irritation. Moore mentions a case of pyelotomy, following which the proliferation resembled a new growth. Permanent renal fistulae are lined principally by the proliferation of this squamous epithelium. Such tissue must be avoided, if possible, in any nephropexy. It is evident that we are at liberty to make use of the fibrous capsule either as the material for permanent supports or as a temporary anchorage, but that any wounding or constriction of kidney substance must be avoided. No doubt a kidney may be fastened into position by numerous transfixions and lacings, especially of non-absorbable material, so that it might never again become a wanderer; and perhaps many a kidney has been so treated. If no infection followed, and the other kidney proved equal to the work of both, the symptoms being relieved, such a case might be classed as a perfect result until someone got a look at that kidney. The operative mortality of nephrectomy on a sound kidney would be low, and that of thus destroying a kidney *in situ*, which is what such an operation amounts to, still lower, and in that respect only would the pexy be better than removal; while nephrectomy would at least remove all danger of further trouble. In other words, the employment of any technic which involves transfixion or compression of any considerable amount of kidney substance in order to immobilize the organ is a frank removal of that organ so far as functional activity goes, is an admission of inability to cure the wanderer other than by destruction, and is little, if any, to be preferred to an elective nephrectomy. The developing sentiment in favor of reliance upon the capsule as either permanent support or as anchorage during the period necessary for scar formation is pictured in the various methods recently found in the literature.

Ach delivers the kidney through the loin and makes two longitudinal incisions in the capsule, running from pole to pole, one on the anterior

and one on the posterior surface. Freeing the capsule between the incisions leaves a wide ribbon attached at each end. A strip of fascia lata is removed, and one end passed under the ribbon of capsule. The kidney is then replaced and the free ends of fascia stitched to the muscular wound margins. This suspends the kidney by its capsule and doubtless later by scar formation to some degree.

Vogel describes a somewhat similar method. He forms a ribbon of capsule similar to Ach's, but cuts it off at the lower end to make a free capsular band attached only at the upper pole. He then resects the 12th rib just outside the transverse process to increase its mobility, and passes the band of kidney capsule up under and around the rib, the end being finally brought down and sutured to the kidney. This leaves the organ suspended from the rib, and again is probably reinforced by later scar formation. One objection to this method is the danger of pleural injury. Mayo has called attention to this danger and Firth mentions a case in which it occurred.

Firth recommends the Billington method of nephropexy. Billington's incision begins high, over the eleventh rib, and he also passes a sling of capsule about the twelfth rib, but without resecting it. The kidney being delivered is carefully freed of fat and any accessory vessels, and a facial flap mobilized from the upper half of the organ, two-thirds of its width from the posterior and one-third from the anterior surface. A curved clamp is forced downward from above and close to the last rib, behind the rib and into the upper angle of the wound, the capsular flap seized and drawn around the rib, to be sutured back to the kidney. Two supporting sutures are also put into the kidney substance in its lower half, to be brought out through all muscular layers and skin to tie over gauze rolls. Like the method of Ach, this presents serious danger to the pleura, and the two supporting sutures, to be strong, must grasp and destroy considerable renal tissue. The method of forming the fascial flap has, however, one point of superiority over that of Ach as well as that of Vogel, in that it is so taken as to tend to bring the normal posterior surface against the quadratus, instead of the convexity, which is obviously not physiological. If Ach and Vogel simply made their flaps on the posterior surface instead of the convexity, this objection would be removed.

Luzoir favors Marion's modification of the Albarran method, which seems similar to the Billington, without the two supporting sutures. The flaps are fastened as high as possible, and the capsule over the lower pole is left to act as a hammock.

Bissell calls especial attention to the incision and delivery of the kidney without injury to nerves or vessels. He frees a capsular flap from the posterior surface, leaving it attached only along the convexity. This flap is sutured to

the muscular edge of the wound after replacing the kidney, but first he passes two stay sutures entirely around the kidney, one above and one below the pedicle, using silkworm gut or wire. The stays are brought out through all layers and skin, to tie over a bolster of gauze. It seems doubtful how much functional activity could be expected from this kidney, but it would probably remain in place permanently.

Kelley has used one method in several hundred cases. He does not free the capsule, and sometimes does not even deliver the kidney. He passes three sustaining sutures into the kidney, two of them into the upper half on the posterior surface. Each suture is so placed as to encircle an area of capsule and as little kidney substance as possible. When pulled upon, the sutures cause each a dimple in the capsule and hold securely. Kelley relies for permanent support upon organic union, which he says soon forms. He is apparently a strong advocate of nephropexy in properly restricted cases. He sometimes brings the upper suture out above the twelfth rib. The amount of damage to the kidney by this method depends upon how much substance is constricted. Simply because a kidney is abnormally mobile or chronically displaced is by itself no indication for operation. Furthermore, many patients with such a condition and with symptoms referable to it, even lacking other demonstrable cause, had better be treated expectantly by such measures as may tend to correction of faulty posture. Such patients, if thin, may improve with a gain in weight, the new deposit of perirenal fat acting as a bolster. One of our cases was so relieved, only to lose her fat two years later, with return of symptoms. Most external supports and cushions are failures, but may be given a trial, the safest course being one of conservatism. Uncomplicated pathologically floating kidney is rare. The writer's cases have all shown some degree of general ptosis save three. One of these was complicated by a mass of dense adhesions at the site of a previous operation on the left tube. The other two were apparently uncomplicated at the time of operation, but one of them had been operated upon eight months previously for a large ventral hernia. The last was the only simple case. In this instance the presence of abundant perirenal fat had not been possessed of the usual virtue. The appendix had been removed elsewhere six months previously but without relief. Palpation of the kidney was unsatisfactory, and the abdomen was first opened for exploration. Nothing presenting save the very mobile kidney, the wound was closed and pexy done through the loin. Complete relief followed immediately. In this case Kelley's method of identification of the pain by the patient on ureteral catheterization and distention of kidney pelvis might have obviated the laparotomy.

There can be little doubt that nephropexy as a curative agent in many obscure cases has been

overworked. Failures followed, and the blame was often put on the operation when it belonged to the operator. Initial enthusiasm over something new or endowed with new virtues by its sponsor often leads to application in conditions for which it is not indicated or by those unfitted by training and experience.

The strength of the organic union between two denuded surfaces depends upon the accuracy with which they are approximated, without undue pressure to interfere with circulation and without infection. The posterior decapsulated surface of the kidney if accurately approximated to the aponeurotic covering over the quadratus muscle will unite securely to it. This union is as reliable for strength as that of a median laparotomy scar. To bring about this union, eliminate complicating conditions and remedy the primary cause make up the treatment of floating kidney.

Our preference is for an incision similar to that described by Kelley. It begins at the lower border of the last rib over the depression at the insertion of the quadratus lumborum and extends downward and forward to a point about opposite the anterior superior iliac spine. In thin subjects a shorter incision may suffice. The insertion of the latissimus is exposed and separated from the rib to expose the lumbar triangle. The ilio-inguinal and hypogastric nerves are identified, usually under the edge of the quadratus but sometimes farther forward, and avoided. The fibres of the internal oblique are separated from those of the quadratus by blunt dissection and retraction to expose the lumbar fascia. This is incised and perirenal fat exposed. The kidney is freed and delivered and held on a pair of gauze strips. The fibrous capsule is now incised from one pole to the other on a line curving along the convexity, but slightly on the posterior side. The capsule is entirely freed from the posterior surface and on the other side of the line of incision over the convexity. The posterior flap of capsule is now turned back and three or four sutures passed through it, each by an encircling stitch so as to firmly grasp a generous amount of capsule. This stitch is similar to that used by Kelley but in this case includes no kidney substance, as shown in illustration. When these sutures are drawn upon, the capsular flap is rolled backward to leave the whole posterior kidney surface bare. Three or four sutures are similarly passed in the edge of loosened capsule over the convexity. The kidney is now replaced and the sutures brought out through muscle and fascia to tie on each side of the wound. The uppermost sutures are brought out close to the rib, but we have never found it advisable to encircle the rib. When all are made firm and tied the posterior surface of the kidney is accurately approximated to the aponeurotic covering of the quadratus, and the area of agglutination upon which we may rely for support must average at least four square inches. If

the two surfaces are put into only partial contact or clot allowed to intervene, the resulting scar will be correspondingly weak. The muscular edges of the wound come easily together and are secured with catgut, the fatty layer and skin being closed without drainage. The wound should be kept dry throughout operation, as in repair of inguinal hernia, and the nerves must be avoided so as not to be injured or included in the supporting sutures.

By nephropexy we attempt to relieve not a disease process or new growth, but a purely mechanical defect. We must accomplish this without destruction of organ or function, and the closer we adhere to principles of physiology in the work, the nearer will we approach the point where the operation is put upon a basis of generally assured success. If we are unable to effect a cure without ruining the kidney functionally we had better leave it alone or remove it frankly. The sling, basket and hammock operations which constrict the kidney are opposed to fundamental principles of physiology. One is at liberty to decapsulate wholly or in part without wounding the kidney in cortex or pelvis. The free capsule offers material for manufacture of permanent supports or for anchorage sutures. Reliance is placed upon scar to hold after repair in other parts, and seems an adequate support here, provided the cause of the ptosis is removed previously or contemporaneously; and provided the kidney is placed in its normal position with the posterior surface, not the convexity, against the quadratus muscle. If the cause is not discovered and removed recurrence may be expected.

Ten cases have been treated according to this technic by the writer.*

AUTHOR'S CASES.

CASE 1. Laparotomy, lysis of adhesions, nephropexy. Cholecystectomy four years later, Dr. C. S. White, Washington, D. C. "Kidney firmly anchored."

CASE 2. Nephropexy. Large ventral hernia repaired eight months previously. Died from causes other than kidney or operation.

CASE 3. Perineorrhaphy, colporrhaphy, ventro-suspension, repair of large ventral hernia, nephropexy. Reported in person, well, kidney in position.

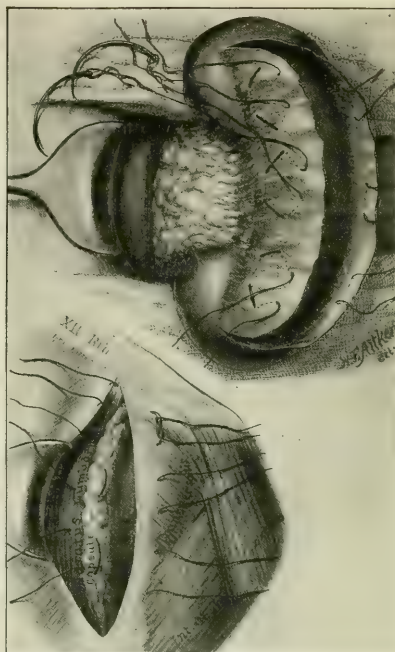
CASE 4. Laparotomy, exploratory, nephropexy. Appendectomy six months previously without relief. Reported in person. Well. Kidney in position.

CASE 5. Perineorrhaphy, double salpingo-oophorectomy, ventro-suspension, appendectomy, nephropexy. Reported by letter. Well.

CASE 6. Perineorrhaphy, ventro-suspension, nephropexy. Reported in person. Still some disability, but much improved. Kidney in position.

CASE 7. Unilateral salpingo-oophorectomy, ventro-suspension, nephropexy. Reported by letter. Well.

* Since this paper was written one other case has been added.



CASE 8. Appendectomy, plication of abdominal fascia to approximate recti muscles, nephropexy. Reported in person. Well. Kidney in position.

CASE 9. Perineorrhaphy, appendectomy, ventro-suspension, nephropexy. Reported in person. Generally well. Dysmenorrhea. Kidney in position.

CASE 10. Appendectomy, ventro-suspension, nephropexy. Reported by letter, "Much better than before operation, but not strong."

CASE 11. Not included in main list. Curettage for uterine polypi. Cystoscopy, appendectomy, nephropexy. Reported in person. Well.

All were females. Eight were married. The youngest was 25 and the oldest 42 years. Each of the married women had at least one child. One had two children. One had three and one had six. Two cases have gone through uncomplicated pregnancies since operation. In no case was there evidence of kidney embarrassment, either early or late. There was no case of prolonged convalescence, the average stay in hospital being seventeen days. All wounds healed by first intention, though one patient had a superficial infection in her abdominal wound made at the same sitting. There was no operation mortality. Of the ten, one has died from causes entirely dissociated from the operation and the others are well. Nine have reported within

two months, five of them in person. These five show kidney in place and all nine report freedom from symptoms present before operation. Length of time since operation of cases included in this series varies from ten months to four and one-half years. In only one case was nephropexy done without abdominal exploration and more or less extensive work there. This case had a large ventral hernia repaired eight months before the nephropexy. The fourth case in the series was the only uncomplicated one. Abdominal exploration revealed nothing but the extremely mobile kidney. The appendix had been removed elsewhere six months previously without relief. Case 1 has recently had a cholecystectomy in another city, the operator reporting to me by letter that the kidney was found securely anchored at time of his operation, over four years after the nephropexy.

SUMMARY.

A mechanical problem is best solved under good mechanical principles.

Success is dependent upon the degree to which normal anatomical and physiological conditions are approached.

The kidney may not be wounded, fixed or constricted with impunity.

Decapsulation, either partial or complete, does not impair kidney function.

The most rational method of securing the kidney in position after it has become a wanderer to such a degree as to demand operation, is that of removing the cause and aiding in the reconstruction of natural support.

Any permanent artificial support is dangerous if not completely destructive to the kidney's functional activity.

The rolled-up and transfixed capsular flap offers a perfectly adequate hold for one end of the anchorage, and the muscular and fascial layers of the loin the same for the other end without sutures which emerge through the skin.

If the anatomical relations of the kidney cannot be permanently readjusted without destruction of its functional activity it deserves to be either let alone or removed.

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ACUTE PERFORATION OF ULCERS OF THE STOMACH AND DUODENUM, WITH CASE REPORTS.

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ACUTE perforation of the stomach or duodenum unrelieved by operation, is one of the greatest disasters that can occur within the abdomen. The termination is usually death in a few days. On the other hand, the results of early operation are among the most gratifying in surgery. Acute perforation of ulcers is not an uncommon accident, and every physician doing general practice should be prepared to recognize it immediately, as the life of the patient depends on early diagnosis. There can be no doubt that this trouble is frequently overlooked until it is too late—until the establishment of a lethal peritonitis. It is a great misfortune to diagnose acute perforation, with gastric and duodenal contents constantly pouring into the general peritoneal cavity, as appendicitis and treat it expectantly according to the Ochsner method. Nothing but disaster can follow such delay.

Last June, Walker, in a paper read before the surgical section of the Massachusetts Medical Society, reviewed the Boston City Hospital surgical records for a period of ten years—1905 to 1915. During this time there were 78 cases of acute perforation of the stomach and duodenum operated upon by 17 surgeons. There were 57 recoveries and 21 deaths. Seventeen patients were operated upon within the first 4 hours and all recovered. Of those operated upon from 5 to 12 hours after perforation, there was a mortality of 17.9%; of those operated upon 13 to 24 hours, 47.6%; of those operated upon 25 to 48 hours, 66.2%. This report very well emphasizes the importance of early diagnosis and surgical treatment.

During the past few years I have had the opportunity to study ten cases of acute perforation of the stomach and duodenum. Six of these were my own cases and four were seen with other physicians. I wish to report briefly my six cases because I had an opportunity to operate upon these patients and watch their progress after operation. These cases were operated on consecutively, with no death.

CASE 1. Mr. M., 35 years, always well—no stomach discomfort of any kind, was seized suddenly after dinner with intense pain in pit of stomach. Nauseated but did not vomit. Unable to continue work. A physician was called to factory (out of town) and diagnosed the trouble appendicitis. Was removed to a relative's house and later to his home in Salem, where he was seen by the writer.

Patient was lying on his back with legs drawn up. Abdomen was rigid and tender, especially over right lower quadrant. Liver dullness normal. Abdominal pain was intense. There was some doubt about diagnosis because of excessive tenderness and rigidity over McBurney's point and because of complete absence of previous stomach trouble, although perforation of a peptic ulcer was seriously considered. Operation advised. Entered hospital June 11, 1912. Temperature 100°, pulse 106.

Operation. Twenty hours after onset of symptoms. A low rectus incision was made. Abdomen was filled with thick bile-stained fluid containing food particles. Appendix removed, a high rectus incision was then made and a perforation of stomach, about one inch from pylorus, was found, with gastric contents pouring through. The perforation was closed with two layers of chromic gut. Three drains were inserted, one to ulcer site, one to kidney pouch and one in lower rectus incision. Convalescence uneventful. Discharged from hospital eighteen days after operation and has since been perfectly well.

CASE 2. Mr. D., age 26 years. Admitted to hospital Jan. 27, 1914. Temperature 99.6°, pulse 96. Dyspepsia for two years. Two days ago was seized with severe pain in epigastrium. Vomited once, nauseated most of the time. Pain has been getting worse. Entire abdomen rigid and tender—most marked in region of gall-bladder. Liver dullness normal.

Operation. High rectus incision 5 inches long. Considerable amount of bile-stained fluid within abdomen. An indurated ulcer which had perforated was discovered in upper part of duodenum. Perforation closed as well as possible and appendix was removed. Drains, one to the ulcer and one to the kidney pouch. Convalescence somewhat stormy. Discharged March 4.

Later History. Remained well for about four months, then there was a return of stomach symptoms. Various remedies were employed by different physicians, which gave only temporary relief. He returned to me for surgical treatment which had been previously advised.

Re-admitted to hospital Dec. 29, 1915.

Operation. Median epigastric incision. Numerous adhesions about stomach and duodenum found. Posterior gastro-enterostomy, no loop, with suture was performed. Convalescence uneventful. Left hospital eleven days after operation. Has since been well.

CASE 3. Mr. K., 33 years. Dyspepsia for five months. Epigastric discomfort, relieved for a time by ingestion of food. Seized suddenly about one hour after breakfast with intense pain in upper abdomen. Seen by me about two hours after onset of symptoms. Patient appeared to be suffering very great pain. Examination showed some tender-

ness and rigidity over whole abdomen, especially over right side. There was no tympany over liver. Pain became progressively worse. Admitted to hospital June 14, 1914.

Operation. Six hours after onset of symptoms. Right rectus incision. When the peritoneum was opened some air escaped, followed by viscid bile-stained fluid. A chronic ulcer of duodenum near pylorus was found, perforated. The free fluid within the abdomen was carefully removed, the appendix excised, three drains were inserted and abdomen closed in the usual manner. Convalescence was stormy. Discharged to his home June 25 because of fire at hospital.

Post-operative History. After returning home, continued to improve, and after three months returned to work. Stomach symptoms returned and these were only temporarily relieved by medical treatment.

Re-admitted to hospital Nov. 9, 1915. A five-inch median epigastric incision was made; many adhesions were found about liver and gall-bladder; pyloric stenosis present. The usual posterior gastro-enterostomy was done. Convalescence uneventful; eating solid food on the fifth day. Discharged well, twelve days following operation. Has since been well. Three months after operation he had gained 21 pounds.

CASE 4. Mr. S., 20 years. Admitted to hospital June 21, 1914. Always well, no stomach trouble. Twenty-four hours before admittance was seized with intense pain in epigastrium. A physician was called who diagnosed the trouble appendicitis. Examination at hospital showed general abdominal tenderness. Tympany over liver. Pain severe. Expression anxious.

Operation. An ulcer about size of dime with a good-sized perforation in centre was discovered in first portion of duodenum. Abdomen filled with gastric and duodenal contents. Perforation closed in usual manner. Three drains were inserted as in the other cases. Appendix removed. Discharged to Peabody Hospital four days later because of hospital fire.

Post-operative History. After leaving hospital was well for about two months, then began to complain of sour stomach and eructations of gas, which symptoms troubled him when last seen, five months ago. Otherwise well.

CASE 5. Mr. A., 39 years. Entered hospital Dec. 9, 1914. Temperature 96°, pulse 100. Mother died of perforation of stomach, one year previous. Dyspepsia for two years.

Immediately after a heavy pork dinner, was seized with intense pain in upper abdomen while at his work in Wakefield. Taken to Salem Hospital.

Examination at the hospital showed board-like rigidity of abdominal muscles, especially marked over right side, above and below. Abdomen retracted, liver dullness normal, expression anxious; patient seemed to realize that something serious had happened.

Operation. Five hours after onset of symptoms. Abdomen filled with thick bile-stained fluid containing food particles. A hole in the center of a large indurated duodenal ulcer near pylorus was discovered. Perforation closed in the usual manner. Appendix removed. Three drains inserted, the lowest one through low right rectus stab wound. Convalescence stormy. Lavage of stomach had to be

resorted to frequently. Discharged Jan. 9, 1915, recovered.

Post-operative History. Since operation the stomach symptoms have been about the same as they were previous to the perforation. Undoubtedly, gastro-enterostomy is indicated.

CASE 6. Mr. S., 25 years. Dyspepsia for three years. Stomach distress much worse the last few months. Was seized with severe pain in abdomen while at work. Unable to continue work. Removed to his home and there seen by writer three hours after initial pain. Abdomen retracted and markedly rigid and tender throughout, especially on right side. Liver dullness normal. Nausea but no vomiting. Facies anxious. Abdominal distress great.

Admitted to hospital Nov. 27, 1915. Temperature 97°, pulse 100. Operation five hours after onset of symptoms. Some free fluid in abdomen, peritoneum everywhere congested. An ulcer discovered in upper portion of duodenum with tiny perforation in the center, discharging duodenal contents. Perforation closed. Appendix removed. A non-loop posterior gastro-enterostomy with suture was then performed. One small drain inserted to ulcer. Discharged fifteen days after operation with small sinus discharging slightly, which healed in about one week.

Post-operative History. Since operation has gained 15 pounds in weight. There has been no return of stomach symptoms which troubled him previous to operation.

Early diagnosis:—In connection with the subject of acute perforation, the most important consideration is diagnosis, as this always implies the need of surgical intervention. There seems to be considerable difference of opinion regarding what constitutes the most dependable signs and symptoms which will aid us in making an early diagnosis. Mayo-Robson, in discussing the symptoms of acute perforation of the stomach in Keen's Surgery, says: "A sudden sharp abdominal pain, accompanied by shock, is usually an initial symptom in perforation. Almost immediately the expression of the face changes to one of anxiety and great distress; the extremities become cold and clammy and the face blanched; the respirations are usually shallow and quick, and the pulse rapid and almost imperceptible at the wrist."

"On examining the abdomen, the recti are rigid and the whole abdomen feels like a board and does not move during respiration. At first the abdomen is retracted but later it becomes distended with gas and fluid, and as a rule a thrill can be obtained in the flanks and later from side to side. Liver dullness is generally absent."

There can be no doubt that these signs and symptoms exist in certain cases of perforation. On the other hand, if we wait for the appearance of rapid, thready pulse, cold clammy skin, fluid wave and tympany over liver, before establishing the diagnosis, I am sure that many cases will be overlooked—and lost. My observations, relative to diagnosis, are based on ten

cases; the six reported and four others that I had an opportunity to examine but not treat. All complained of sudden, severe pain in the epigastrium. This pain was of the superlative type, perhaps not so bad as that seen in acute pancreatitis, but worse than that observed in the ordinary appendix case. Eighty per cent. of patients gave a history of previous stomach trouble of greater or less degree; 20% had none whatever.

All the cases gave evidence of general abdominal tenderness and muscular rigidity early. In this connection I believe it is well to use the expression *first hour*, general tenderness and rigidity in contradistinction to the later manifestation of these signs in appendicitis, and some other acute abdominal conditions. Nausea and vomiting occur with so many abdominal disorders that they are of little value as diagnostic symptoms. Hematemesis did not occur in any of the ten cases. All the patients suffered great abdominal distress. They looked anxious, apparently realizing that something serious had occurred within the abdomen. Operation in each case was accepted without hesitation. Nine cases occurred in men from 20 to 65 years of age. One was in a young woman of 20 years.

Perforation of duodenal ulcer near pylorus occurred in seven cases. Perforation of gastric ulcer within 1½ inches of pylorus occurred in three cases. In operating on my cases, chronic gut was used to close the perforation, as I disliked to leave silk or linen in an infected field.

Drainage:—One drain was usually inserted to right kidney pouch, one to ulcer, and one through a low right rectus incision—preferring this to the usual suprapubic drain. In relation to this matter, W. S. Smith, in his experiments showed that in perforation of the duodenum the fluid first runs downward in the direction of the right kidney pouch. When this is filled, it descends along the outer side of the ascending colon as far as the brim of the pelvis. The level of the fluid rises until it reaches the pelvic brim, then overflows into the pelvis. This explains why, especially in duodenal perforation, appendicitis is frequently simulated.

Gastro-Enterostomy:—It is often difficult to decide whether it is wise to do a gastro-enterostomy at the time of closure of perforation, as was done in Case 6. This is especially true in duodenal cases with extensive induration. Moynihan was the first to advocate gastro-enterostomy under these conditions. Since then many surgeons, notably Deaver, have advised this procedure as routine treatment. It seems to me that good judgment must be used in this matter by the average surgeon, as a promising case may be rendered hopeless by too much surgery.

CONCLUSIONS.

1. Acute perforation of gastric and duodenal ulcers is not an uncommon accident.

Early operation yields a high percentage of cures. Late operation gives a low percentage of cures, even when performed by a master surgeon.

2. It occurs most frequently in adult males giving a history of stomach trouble. Complete absence of dyspepsia (Case 1) should not preclude the possibility of this diagnosis.

3. The most important diagnostic guide is the occurrence of sudden, severe, epigastric pain immediately followed by signs of spreading peritonitis, which manifests itself by the presence of general tenderness and muscular rigidity.

4. Early or first hour general tenderness and rigidity are very important signs in differentiating acute perforation from appendicitis and many other surgical lesions within the abdomen.

5. The points of maximum tenderness and rigidity are at first, especially in duodenal perforation, on the right side above and below. The rigidity later becomes board-like over the whole abdomen. This is quite distinctive of perforation, although in exceptional cases it may not be present.

6. Tympany over the liver is usually not present. It may occur, however (Case 4). Its absence should not militate against the diagnosis.

7. The abdominal pain as a rule is very severe and patients have an anxious expression, apparently realizing that something serious has occurred within the abdomen. The pulse, however, is often only slightly accelerated in the beginning. This is surprising considering the gravity of this condition.

8. Early operation, implying repair of perforation with or without gastro-enterostomy, should give a high percentage of recoveries.

9. Simple repair is apt to be followed by stomach symptoms, which later require gastro-enterostomy for their relief.

10. In properly selected cases, gastro-enterostomy, performed at the time of closure of perforation, is followed by most gratifying results.

Therapeutic and Preventive Medicine.

POST-OPERATIVE TREATMENT.*

By HAROLD G. GIDDINGS, M.D., BOSTON.

For the attainment of successful end-results in surgery it is essential that patients subjected to operations or to surgical procedures should receive throughout convalescence treatment commensurate and compatible with the particular procedures indulged in. Such treatment cannot logically be separated from the operation itself;

indeed, it is a very vital factor in the success or failure of the operation. Sooner or later it is the experience of almost every practising surgeon to have to record as a failure the final results of a particularly satisfactory piece of work, because of some error of judgment in the care of the case subsequent to the operation. This error of judgment, failure to do the right thing at the right time, may be an error of omission or one of commission, either on the part of the surgeon himself, his assistant, his house officer, or his consultant, whichever has to do with the post-operative care of the case.

Along with the development of surgery and its technic have gradually come to be recognized certain definite principles of post-operative treatment, and it is with these, for the most part, that this paper will deal. "For the most part," advisedly, because in a field where definite, detailed procedure is so essential and so vitally a part of the whole broad subject, it is impossible entirely to ignore particulars; and in surgery, as in warfare, sanitary science, or football, it is attention to detail that makes for success.

Though it may seem paradoxical, post-operative treatment really begins with pre-operative care. By this we mean that in order better to get the desired ultimate results, it is essential that our patients be properly prepared beforehand, both mentally and physically. We all know with how much more fortitude and complacency the average individual approaches the operating table if he has become somewhat familiar with his surroundings, with those who are to care for him during his convalescence, and if he has been made to feel that the impending operation is not, after all, such a terrible bugaboo. Mental apprehension beforehand unquestionably lowers to a certain extent, depending, of course, upon individual temperaments, the patient's resistance and recuperative powers. Perhaps the most striking example of this is in goitre cases. The majority of these patients do much better after operation if they are kept in ignorance beforehand of the exact time, or even day, at which the operation is to be done. The same is true, perhaps to a lesser degree, of highly excitable and nervous women, who are likely to be sleepless and frightened, and to lose ground by delay. But on general principles it is better, when possible, to give patients a preliminary rest in bed before operating. Besides the confidence already referred to, which they acquire, the surgeon has an opportunity to study carefully the case, to learn the physical conditions, a knowledge of which may prevent a subsequent calamity, to become acquainted with the peculiarities of the individual, and to determine what anesthetic is best. The presence in the urine of acetone or diacetic acid forbids any but an emergency operation. Sugar, or granular or fatty casts, or a considerable quantity of albumen, makes us hesitate to operate. The advisability of operation on patients with hemoglobin under 50%, except for

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bleeding, is questionable. Constipation should be corrected as far as possible. Besides increasing the possibility of wound infection through escape of intestinal bacteria into the tissues, it adds to the patient's discomfort; also, by decreasing the patient's resistance, it increases the chance of infection from without. Violent purgatives should be avoided. They act as depressants. The rational of emptying the bowels by a saline cathartic the night before, and by an enema on the morning of operation, is that should a shock enema become necessary during or after operation, the bowel will absorb the enema much more readily. Also, in abdominal operations the intestines are much more easily manipulated. If iodine is to be used as a disinfectant, the surface to which it is to be applied may be scrubbed with soap and water several hours before, but not immediately preceding, operation. This is because the water swells the surface epithelium and prevents the iodine from entering into the skin. Operations should preferably be done in the morning. Thus the patient is saved several hours of dread and worry, and the surgeon is at his best.

Certain post-operative complications may be guarded against by watchful observation on the part of the anesthetist during the operation. In capital or prolonged procedures, in operations upon weak and debilitated persons, or at times when haste is essential, much valuable information may be had from frequent readings of the blood pressure. The warning of approaching disaster given by this scientific course enables the surgeon to order proper stimulation to prevent the calamity, and oftentimes from going on with the operation to do something advisable, but not absolutely necessary. It is perfectly possible and practical for the anesthetist to follow the blood pressure without in any way interfering with the operator. This is done by the auscultatory method, using a Tycoos instrument, the bulb and dial of which may be carried to the head of the operating table merely by lengthening the rubber tubing.

Immediately at the end of the operation, the patient is to be carefully wrapped in blankets and placed in a bed previously warmed with suitable heaters. The temperature of these should not be above 110° F. When the patient is put to bed, these heaters should be placed about him, *always* outside the blanket, never inside, for the danger of burns is ever-present, and cannot be too strongly emphasized. The patient must never be left alone. A reliable nurse or attendant should remain with him to guard against accidents from choking or vomiting, or to prevent any act of violence. A watchful attendant will frequently note the appearance of symptoms premonitory of collapse, which demand immediate relief measures. Following operations in or about the mouth, the tongue must sometimes be held forward until the patient is fully out of the anesthetic.

Unless there be special contra-indications, it

is best to place the patient on his right side, propped there by pillows at his back. Hewitt advances these reasons for so doing: "In this position stertor at once ceases; the tongue gravitates to the side of the mouth, and a free airway is established; mucus and saliva are not swallowed; coughing is prevented, and should vomiting occur, any vomited matter will readily find an escape from interfering with breathing."

It is the writer's practice, almost without exception, to give hypodermatically, as soon as the patient is in bed, or recovering consciousness, a proper dose of morphine. This keeps the patient quiet until the immediate effects of the ether have worn off, and prevents the restlessness so common after anesthesia. Also, it lessens the pain incidental to the operation.

As an accompaniment to post-anesthetic nausea and vomiting, it is usual to have a certain amount of pallor and feebleness of pulse. This should occasion no alarm, unless it continues and becomes progressively worse, when measures should be taken to combat it.

As the patient recovers consciousness, there arises the question of posture. Probably because it has become a custom, patients are usually kept on their back. There are many definite objections to this position. "Women," says Morse, "who are kept long in this posture after laparotomy are very liable to develop cystitis, from inability to empty the bladder completely. The position also undoubtedly increases to some extent the nausea and vomiting, as it allows the mucus or saliva to collect in the mouth and fauces." It is also responsible for much of the backache of which patients complain. Very few people, as a matter of fact, sleep wholly on the back, and when forced to do so, are most uncomfortable. The posture straightens the lumbo-sacral curve, putting on a stretch the muscles and ligaments in this region, and thus inducing pain. If, for any particular reason, the patient must lie on his back, the lumbar region and knees should be supported by pillows. There is also an increase in the tendency to gaseous distention in the dorsal position.

It is our practice to allow patients to assume, as soon as they wish, whatever position is the most comfortable, nor do we remember any evil results therefrom.

The Fowler, or semi-erect position, is one of our greatest assets in treating cases of appendicular abscess, septic peritonitis, or any condition in which the patient has been exposed to abdominal infection. In this position, all the fluids gravitate to the pelvis, the lymphatic supply of which is relatively poor. This means, of course, less absorption. It is in the upper part of the abdomen that the lymphatics are most abundant, hence the desirability of keeping septic material from this area. The fluids gravitating to the pelvis are very readily carried off by proper wound drainage.

Thirst. One of the most unpleasant after-effects of anesthesia is the intense thirst,—not infrequently it is more distressful to the patient than the pain itself. DaCosta and Kalltayer have demonstrated that following anesthesia the watery elements of the blood are diminished, and that the intensity of the thirst is nearly always increased in proportion to the amount of blood lost during the operation. The thirst following ether is probably greater than after any other anesthetic. One of the most satisfactory methods of allaying this condition is to give directly after operation, either before the patient leaves the table, or as soon as he is put to bed, a high rectal enema of warm salt solution. The average rectum tolerates and retains from four to six ounces, which may be repeated every four hours. This also acts, of course, as a stimulant. The fluid is absorbed from the rectum into the circulation, thereby replacing the lost element. Patients invariably call for cold water, but sips of hot water unquestionably give greater relief. It is our custom to allow the patient a liberal amount of hot water if he desires it, soon after recovering from ether. This almost invariably washes out the stomach, thus overcoming, to some extent, the nausea and vomiting, and enables the stomach to retain more of the fluid which is subsequently allowed. If the water does not suffice, a little champagne on shaved ice, a little hot black coffee, cold wet cloths kept in the mouth, or frequently bathing the lips and rinsing out the mouth with cold water, usually does.

Nausea and Vomiting. Post-operative nausea and vomiting is another exceedingly uncomfortable complication, and one which may at any time assume serious proportions. The nausea coming after ether is likely to be much more severe than that following gas-oxygen, chloroform, or any of the so-called ether-chloroform-ethyl-chloride mixtures. Indeed, it is advanced as one of the strong points in favor of gas oxygen anesthesia that it is free from this unpleasant complication. This has been the writer's experience, too, that while there usually is a certain amount of nausea after this form of anesthesia, it is likely to be much less than after the other forms. In general, it may be said that the amount of vomiting after anesthesia is in direct ratio to the length of the anesthesia and the quantity of the anesthetic. Bearing this in mind, it should be our endeavor to reduce to a minimum the volume of anesthetic.

The nature or extent of an operation undoubtedly has its influence upon post-operative vomiting. Operations upon the intestines, female pelvic organs, protracted laparotomies in which the bowels are exposed or freely manipulated, or in which there is much traction on them, are more likely to be followed by post-operative sickness. Lewin advances the theory that "the vomiting is frequently due to swallowing the mucus and saliva containing some of

the anesthetic in solution. The anesthetic thus acts as a direct irritant to the stomach, and vomiting is induced by the elimination of the drug through the glands of the gastric mucosa." He suggests two plans to prevent this local effect: first, a local cocaineization of the gastric mucosa; second, by protecting it by the use of some substance which will form a coating over it, such as mucilage of acacia, or by a thick decoction of Iceland moss. To combat these conditions numerous remedies have been used. Hot coffee, champagne, small doses of cerium oxalate, or bismuth sub-nitrate, or calomel in small and frequently repeated doses, sodium bicarbonate, have all been employed with more or less effect. We personally have found lavage with sterile water or salt solution to give the most beneficial results.

Gastro-Mesenteric-Ileus. Following upon post-operative vomiting we every now and then meet with a case of so-called gastro-mesenteric-ileus. In this there is a persistent and seemingly uncontrollable vomiting, at first merely of mucus and bile, and later brownish, foul-smelling material. The patient is usually very much distended, and almost always it is possible to outline the stomach, which is the most distended organ of all. The condition is one not absolutely understood, but is probably due to kinking of the gut at a point near the stomach. Unless recognized and properly treated, it is very likely to end fatally. The only treatment which is of real benefit is frequent and thorough lavage. As the tube enters the stomach, there is usually a tremendous rush of gas, followed by quantities of the material described. We recall the case of a young, vigorous man, who had a severe local peritonitis following an acute appendiceal attack. His vomiting began as soon as he recovered from ether, becoming increasingly more violent, and within a few hours the character of the vomitus became that already referred to. The stomach was tremendously ballooned, making respiration extremely difficult. Lavage with normal salt solution was instituted and repeated many times, at two-hourly intervals. It was several hours before there was noticeable improvement. It was necessary to continue the lavage for nearly three days before the stomach washings were clear. As soon as the conditions improved, the patient began to get better, and made an uninterrupted convalescence. In this class of cases there is likely to be marked prostration or even collapse, calling for most vigorous stimulation.

Pseudo-Ileus. Another unpleasant complication now and then encountered is that of intestinal paresis, or pseudo-ileus. To again quote Morse, "This implies a form of intestinal obstruction brought about by a certain degree of muscular paralysis of the intestinal tract." The condition may follow prolonged intestinal exposure, but is most likely to follow minor procedures. No definite pathological condition has, so far as we know, been demonstrated in these

cases, but rather they seem to be neurotic in character, and to be due to lack of intestinal nerve force. It is very easily confused with peritonitis. There is marked distention of the bowels, apparent exhaustion of the patient's vital forces with sub-normal or normal temperature, feeble pulse, the symptoms usually coming in from 48 to 72 hours after the operation. One of the most distressing symptoms is inability to move the bowels. In treating the condition, the aim, of course, is to establish peristalsis as quickly as possible. The stomach should be washed out, and high rectal enemas containing vigorous peristaltic agents, should be given. An enema which we have found useful consists of magnesium-sulphate, glycerine, salt solution, each 2 oz., powdered aloes, 40 grains. This mixture is very often sufficient, but if it fails, to it may be added 2 dr. of turpentine, often with good results. At the same time should be given active cathartics from above, such as calomel in divided doses, followed either by Rochelle or Epsom salts. Eserin salicylate may be given in 1/20th grain doses subcutaneously.

Hiccough. Hiccough is sometimes persistent and hard to control. It is usually indicative of inflammatory conditions of the abdominal viscera. It is seen with post-operative as well as ante-operative peritonitis. If it be due to gastric irritation, lavage is sometimes promptly curative. Morphia may control where other remedies fail. Sometimes ether sprayed over the epigastrium is sufficient to cause it to disappear.

Post-Anesthetic Complications. There are certain conditions directly the result of the anesthetic itself, which we meet at times. Such are ether burns of the face, easily prevented by spreading vaseline over all surfaces with which the ether may come in contact, either directly or through the cone; conjunctivitis, which is the result either of the ether vapor or of the ether itself getting in the eye. This is best prevented by a towel over the eyes, but if once acquired, usually yields promptly to frequent washings of the eyes with boracic solution. Ether pneumonia, fortunately, is rare. It is usually of the broncho type, but may develop into the lobar. One of the early tragedies in our experience was a death from ether pneumonia, following so simple an operation as amputation of the thumb. The treatment of this type of pneumonia is very like that of the ordinary pneumonias with which one meets. It is apt to run a short, sharp course. Acute nephritis, with suppression of urine, is rarely met with, but is a condition which must be borne in mind. The treatment of this complication is essentially that of acute suppression under non-surgical conditions, hot packs, diuretics, and purgation.

Post-Operative Temperature. Following any operation it is usual for the patient to have a certain amount of temperature. This differs materially from surgical fever, and bears no

relation to infection, when moderate in degree. This type of fever in clean cases seldom lasts more than 48 to 60 hours, and rarely exceeds 102° or 103° F. There is usually associated with it an increased pulse rate. Let alone, the condition usually subsides of itself, but practically always disappears directly after catharsis has been established.

If for any reason, the temperature does not fall, it should lead the physician to a careful investigation of his patient, both local and general, for it must always be borne in mind that there may be occurring some condition due in no wise to the operation. One of the most striking examples that we recall was that of a patient operated upon for gall-stones. She developed typhoid and, on top of this, a pneumonia. Needless to say, she died. We frequently have seen tonsillitis intercurrently during convalescence, also scarlet fever and other diseases directly to blame for the continued temperature, and easily overlooked. Excluding extraneous conditions, however, a continued elevation of temperature after a clean operation usually means wound infection.

Wound Infection. Wound infection may either remain local, or, by dissemination, become general. When it is local, the patient usually complains of tightness, soreness, or stinging pain in the wound itself. Investigation may show nothing, whatever, especially in the early stages. Soon, however, it will be noticed that there is a little swelling at some point in the wound, with possibly a little redness if the infection be near the surface. Palpation reveals marked tenderness, causing the patient to pull away. Such an infection is of one of two types,—phlegmonous, or there may be actual pus formation. In the former type, frequently changed poultices of some hot antiseptic, preferably bichloride in a 1-2000 solution, is sufficient to overcome the infection. If this fails it may be necessary lightly to scarify the area. In the very early stages an ice bag will usually abort the infection. In those instances in which actual pus formation has taken place, there is only one thing to be done. That is, to open the wound and drain out the pus. In doing this be sure that the opening is large enough. If the pus has burrowed, the incision should be carried directly over the path of the burrow and virtually to its limit. This free drainage induces healing very much more quickly than wicking the wound underneath the skin.

The other type of post-operative infection is a septicemia, or pyemia, which, of course, means a general infection. To combat this, drastic measures must be taken. In general, the various channels of elimination should be encouraged to do their best. The patient's strength should be kept up by proper stimulants, and the source of the infection sought out and eradicated.

Post-Operative Hemorrhage. This may be a matter of gravity, or merely one of annoyance.

If of the former type, there is sudden collapse, pallor, rising pulse, which becomes constantly more threatening, and if the hemorrhage be occurring in the abdomen, it is usually possible on percussion to obtain shifting dullness in the flanks. Such a condition calls for immediate interference on the part of the surgeon. The patient must be anesthetized, the abdomen opened, the bleeding point found, and secured. Once this is done, stimulants must be administered. In those hemorrhages referred to as *annoying* it usually means that there is going on a capillary or venous ooze. This type is most likely to be seen after amputations or operations upon pus cavities, bones, ribs, the tongue, or on any vascular areas. It may be due to the slipping of ligatures, or neglect on the part of the operator to ligate the smaller vessels, or failure to stop all oozing at the time of the operation. This form of hemorrhage becomes manifest in from two to four hours after operation through the dressings and bandages becoming stained or soaked with blood. Dressings should be immediately removed, and the source of hemorrhage, if possible, ascertained. If the bleeding is from a vein, all constriction above the wound must be removed. If the hemorrhage is not profuse, new dressings should be firmly applied and held in place by a snugly-fitting bandage. Usually this is all that is necessary. If the bleeding point is deeply seated, pressure may be applied in the form of a compress directly over the surface of the wound.

Care of the Wound. As a general principle, it may be said that the less we interfere with clean wounds, the better. It is usually well to examine a wound from 48 to 72 hours after operation. If infection is going to occur, it usually is manifest by that time, and it is early enough in the majority of cases to cut short the infection. After this first dressing, unless the patient complains of tenderness, or unless there is a rise in temperature, the wound need not again be looked at for three or four days. If at any time on examining the wound, it is found that the stitches are pulling or cutting, or if there is redness about them indicative of slight infection, they should be immediately removed. On general principles, stitches may be taken out on the seventh or eighth day. Depending upon the length, situation, and character of the wound, we may or may not use adhesive strips to hold the edges together following the removal of stitches.

When to remove the wicks is a question of importance. If the wick is put into a clean wound at the time of its closure, merely for the purpose of draining off whatever serum or blood may accumulate, as in hernias, or in clean dissections upon the neck, the wicks or drains may be safely withdrawn within forty-eight hours. Whether or not the original should be replaced by another at this time must be decided in each instance. If there be much dead space, and if there has been a considerable amount of fluid

drained away, it is advisable to reinsert a wick for another day or so, but only under these conditions. As to the time when to remove drains from infected wounds, there can be no definite rule. Each case must be considered by itself. In abdominal wounds drained for a moderate degree of infection for a local peritonitis, it is our custom to start the wicks on the fourth or fifth day, to withdraw them two or three inches on each succeeding day, until on the seventh or ninth we completely remove them. If there has been much infection, or if the wound is draining profusely at the time the original wicks are removed, they should be replaced and carried well into the abdominal cavity along the same tract in which they were lying. In these cases the wick should be changed daily, after the original has been withdrawn, or at the most, every other day. If the wound is to be irrigated, irrigation should not be begun under the tenth day, for before that time the walling-off adhesions have not become sufficiently established to safely warrant irrigation. Various substances may be used for washing out wounds,—mild bichloride, a boric solution, or what the author believes to be best, normal salt solution, which tends to encourage healing. In these cases in which there has been comparatively little infection, and from which the abdominal wicks are removed from the fifth to the seventh day, there should be carried down to, but not through, the peritoneum, a small gauze drain. This may be gradually withdrawn during the next three or four days, and left out entirely by the eighth or tenth day, and the edges of the wound strapped together.

Feeding after Operation. Patients should be given nothing to eat until the nausea and vomiting has entirely disappeared. Following its disappearance they may have, for the first twenty-four hours, liquids without milk. Such a diet includes milk broths, the white of eggs, grape juice, orangeade and lemonade. Ginger ale is sometimes given, but we feel that it is productive of so much gas that it should be interdicted. Usually 48 hours after operation we give our patients 2 gr. of calomel in quarter-grain doses, at half hourly intervals. In an hour after the last dose we follow the calomel by a saline cathartic, either magnesium sulphate, or citrate of magnesia. One hour later this is followed by a compound enema, containing glycerine, magnesium sulphate and water, 2 oz. of each. After the patient's bowels have freely moved we allow him a diet of soft solids. This includes dropped eggs, moistened toast, crackers and milk or broth, jellies, strained soups, bread without crust, custards, soft puddings and the like. Within another twenty-four hours, if all is going well, we increase the diet to include solids, starting, of course, very gradually. By the end of the fifth or sixth day, the patient is usually allowed that which is called house diet.

Post-Operative Shock. Immediately after major operations, and in minor ones in which there

is evidence of exhaustion, and before the patient is removed from the operating table, a high shock enema should be given at a temperature of 110° F. The ingredients should be black coffee, brandy, salt solution, each 2 oz., and 1 drm. of adrenalin chloride. Some stimulant should also be administered hypodermatically. Strychnia is commonly employed, but seemingly better results are obtained from camphor in oil, 3 grains in about one-half drachm. Other measures combative to shock, whether it comes at the end of the operation or later, are the placing of heaters about the patient, bandaging of the lower extremities from toes to thigh, elevating the foot of the bed from 8 in. to 12 in., and in severe cases a pint of normal salt solution containing either 1 drm. of adrenalin, 1 oz. of brandy, or both, should be given under the greater pectoral. The adrenalin should never be given in any greater concentration than this, as it may cause a local necrosis of tissue, just as salvarsan does, which is extremely difficult to heal. By rectum, until there is response to the relief measures, there should be given every four hours, 2 oz. of brandy in 4 of salt solution. Other stimulation may be given as is considered necessary. In cases in which the shock is primarily due to great loss of blood, intravenous infusion of one pint of normal salt solution, or a direct blood transfusion, will many times bring the patient to a favorable turning point. It is always well, too, in shock cases, to give morphia, as the more quiet the patient is, the better. The drug, too, undoubtedly has an indirect stimulant effect. As the pulse begins to improve, the stimulation may be gradually reduced, but it should not be too suddenly withdrawn. It is well to leave the foot of the bed elevated for several hours after the pulse has become fairly good, for a sudden change in the patient's position may cause a recurrence of conditions.

There is a great deal more to be said about post-operative treatment, but the aim here has been to touch upon the underlying principles, and briefly to describe treatment of some of the more common complications. But let it once again be emphasized that we can hope for good results from our surgery only by giving our patients the most watchful and detailed treatment during convalescence.

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STREPTOCOCCAL INFECTION
SIMULATING DIPHTHERIA.

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EPIDEMIOLOGICAL aspects of the spread of the so-called "grippe" are notable from their complete absence. The following case, a type commonly seen during the past season, is of especial interest in its epidemiology.

Case History. C. M., age 3, female, after sudden onset of laryngeal stenosis, was intubated and sent to the Isolation Hospital as a case of diphtheria. Reported January 28, 1916.

Epidemiology. Family, one of six occupying the house, consisted of five children. Of these, R. M., male, age 3, showed a bilateral excoriating sanguino-purulent nasal discharge with crusted lesions of chin and cheek. The remaining three children showed no nose or throat lesions, and there was no history of previous sore throats. Of the children of the other five families, one, N. C., a female, age 3, had been reported as a clinical case of diphtheria on December 28, 1915, and had at this time an acute nasopharyngitis. Cultures in December had repeatedly shown the streptococcus only. The onset, temperature and tonsillar lesions were corroborative, and her infection was traced to a family of four children, all of whom had had streptococcal sore throats in August, 1915, and at the latter period two of them had recurrences. One of the latter was a female, aged 3, and a playmate of N. C., living in an adjacent house. R. M. had had the nasal lesions for several days, the chin and cheek lesions appearing after the nasal discharge. For the ten days previous, he had been a constant companion of N. C., after the latter had been released from quarantine.

Cultures. R. M. showed pure cultures of the streptococcus from both nares and from the chin and cheek lesions. The remainder of the family showed negative cultures. N. C. showed positive streptococcus only.

Course of Infection. On February 8, 1916, two older sisters of R. M., ages 8 and 10, had streptococcal sore throats, and the remaining child, an infant, at this time showed recent impetiginous face lesions, yielding, on culture, the streptococcus. The entire family was quarantined from January 28 to latter February, when C. M. was returned from the hospital. At this time the nasal discharge and face lesions of the carrier, R. M., had been cured. At no time did R. M. develop a sore throat.

Conclusions. Streptococcal infections may not only exactly simulate diphtheria clinically, but there may likewise be demonstrated true carriers. The carrier, as in diphtheria, may be a pharyngeal or a nasal one in type. The latter type, as in diphtheria, is the one giving rise to secondary cases.

AN INTERESTING CONTACT CASE OF DIPHThERIA.

By JOHN A. CECONI, M.D., BOSTON.

Medical Inspector, Medical Division of the Boston Health Department.

AN interesting and instructive case was officially called to the attention of the Boston Health Department, recently. It emphasized the well known fact that care should always be exercised in determining the diagnosis where there is a possibility of a venereal infection or otherwise.

Katherine —, age 7 years, was taken by her mother to the family physician on account of the discovery by the mother of a discharge from the vulva. The physician, with apparently undue haste, made the diagnosis of gonorrhoeal infection and stated that in his opinion the child had recently been raped. No smear was taken and the diagnosis was evidently made solely on the presence of the discharge from the vulva. The statement made by the physician naturally disturbed the mother and father of the little patient and they consulted the Boston Health Department. Upon being assigned to the case, I found that the child had a sero-sanguineous discharge from the vulva. There was a decided exudate on the lower part of the vulva and it extended on to the perineum in the form of an incrustation. There was a noticeable quantity of blood exuding from this exudate. There was a marked odor which was the first indication to the mother that there was anything unusual. I found no clinical evidence of rape.

On questioning the child, I learned that there had been a discharge for at least one week. Eight smears were taken for the purpose of determining the presence of gonococci. They were all reported negative by the laboratory. These smears were taken from various parts of the vulva, from the urethra and from different areas of the exudative process.

The next morning I was called by the mother to treat another daughter, age 14 years, and found her with a clinical case of faucial diphtheria, which diagnosis was confirmed by a positive K.L. from the laboratory. This development naturally suggested an investigation for the probable carrier in the household, and a routine examination disclosed another sister, aged 5 years, with a distinct membrane in each nostril from which a positive culture was reported from the laboratory. This last sister slept with the child who had the exudative process in the vulva, and the former, on further questioning, was found to have had a bloody discharge from the nose for two weeks previously.

Katherine was given 3,000 units of anti-toxin as soon as I made a clinical diagnosis of diphtheria in her other two sisters. Three thousand units were subsequently administered to her eight hours later. No other treatment was instituted in her case.

Marie, the child with clinical faucial diphtheria, received 15,000 units of anti-toxin in forty-eight hours. Margaret, who had clinical nasal diphtheria, was given the same quantity in the same interval.

Two other children in the same family, who were clinically negative, naturally received an immuniz-

ing dose of 1,500 units. Marie, with faucial diphtheria, made an uneventful convalescence, showing two negative cultures on the eighth day. Margaret, with nasal diphtheria, had a protracted convalescence, two successive negative cultures for release not being obtainable until the twenty-fourth day from the date of the first treatment.

In this (Katherine's) case, the discharge from the vulva cleaned up in forty-eight hours after the first injection of anti-toxin. The exudate disappeared in the same length of time.

It may be remarked in her case that she showed no positive cultures, but it is a well recognized fact among bacteriologists and epidemiologists, that not infrequently such is the case in diphtheritic vulvitis, on account of the presence of other microorganisms common in the vaginal secretions which prevent the growth of K.L. bacillus.

Diphtheria of the vulva is not a very common disease, but it would seem to me that we have here a well defined case of this type. The presence of the other two cases of diphtheria in the same family, the fact that the child with nasal diphtheria slept with Katherine (vulva type) showing the probability of contact, and the very rapid recovery after the administration of anti-toxin, certainly seems to bear out my contention and emphasizes the fact that one should be ready to recognize the probability of contact cases, and that it is possible to have diphtheria invade unusual channels.

Reports of Societies.

NEW ENGLAND SOCIETY OF DERMATOLOGY AND SYPHILIS.

THE second meeting of the Society was held at the Boston City Hospital on November 18, 1915, with the President, Dr. Abner Post, in the chair.

The following cases were presented and discussed:

1. RODENT ULCER (TEREBRANT VARIETY). PRESENTED BY DR. T. W. THORNDIKE.

The man was 49 years of age, with no venereal history. Fifteen years ago two or three hard lumps appeared on the forehead. Six years ago the disease became pronouncedly ulcerative, the erosion beginning at the inner canthus of the eye and progressing steadily, without any tendency toward cicatrization, until the whole upper half of the left side of the face had been destroyed down to, and including, in places, the bone.

The man has had x-ray treatment, with much resulting benefit.

2. CASE FOR DIAGNOSIS. PRESENTED BY DR. W. P. BOARDMAN.

The condition appeared about one year ago, just after the birth of a child. At first the appearances were those of an acute eczema,—deep pigmentation, scaling, sharp borders and marked rosacea. Since then the eruption has changed very little. Many forms of treatment have been tried, and the most

successful results have been obtained from salicylic acid and resorcin.

Dr. TOWLE believed the condition to be an irritated chloasma rather than an acute eczema.

Dr. BOARDMAN stated that scaling was at first a marked feature.

Dr. TOWLE replied that the original chloasma had probably been modified by treatment.

3. PSORIASIS. PRESENTED BY DR. W. P. BOARDMAN.

The child was four years of age and was brought before the Society merely because of the extent and the severity of the process in one so young.

4. LUPUS VULGARIS. PRESENTED BY DR. T. W. THORNDIKE.

A case of lupus vulgaris of the serpiginous type, which first appeared as a small nodule when the patient was about twenty-two years old, in the beginning gradually enlarging, but later growing with rapidity. The blood was negative according to a Wassermann test. The patient has had various forms of treatment, including CO₂ snow and radium, without any success, but has finally received four x-ray exposures and now shows appreciable improvement.

Dr. WHITE drew attention to the seat of the disease in the scalp—a rather unusual site for lupus vulgaris.

5. LUPUS VULGARIS. PRESENTED BY DR. T. W. THORNDIKE.

A case of lupus vulgaris of the exfoliating type. The lesion is somewhat scaly, leaving very little cicatrix; in fact the cicatrix rather resembles an atrophy than a true scarring. The edges of the atrophic area are not elevated; there have never been any nodules noted, and the process has shown no tendency towards ulceration. For these reasons it would be well to consider whether this is not a case of lupus erythematosus. The Wassermann test is negative. The patient has improved under x-ray treatment.

Dr. BURNS said that he had seen the patient five or six years ago. There were then very evident lupus nodules about the periphery, and distinctly nodular, ulcerative and exfoliating areas were present. The diagnosis of lupus vulgaris was made at that time and should be made now.

6. ECZEMA. PRESENTED BY DR. G. P. HOWE.

A case of very severe eczema, followed by very extensive alopecia. The disease is now clearing up, but as yet the hair has scarcely begun to return.

7. KELOID. PRESENTED BY DR. T. W. THORNDIKE.

Duration, fifteen months. The young woman burned herself with alcohol, and the subsequent keloid has caused deformity, contraction and pain. The new growth was excised, but after the operation the recurring keloid was 50% larger than the first, and exquisitely tender. The patient has had twenty-five exposures to the x-ray, and as a result the pain has entirely disappeared, the growth itself has subsided entirely 50%, and there is now no discomfort whatsoever.

8. CONGENITAL NAEVUS PIGMENTOSUS ET PILOSUS. PRESENTED BY DR. T. W. THORNDIKE.

The patient states that her mother, just previous to patient's birth, was attacked by a dog. The great interest in the case lay in the form of therapy to adopt. Should the hair be removed by x-ray, with the possibility of a resulting burn? Should CO₂ snow or liquid air be employed? Should the area be excised and a plastic operation done? One must remember that these growths are potentially malignant if left alone. If the lesion is irritated now, the possibility of subsequent malignant growth is increased.

Dr. BURNS advised the use of CO₂ snow, stating that where the hair was fine the snow destroyed both the hair and the pigment, but where the hair was coarse then electrolysis or x-ray had to be employed in addition.

Dr. OLIVER preferred excision in the present instance.

Dr. THORNDIKE asked if excision would tend to encourage malignancy.

Dr. OLIVER replied that the chances of malignancy were very slight.

Dr. THORNDIKE stated that in his opinion the dangers of malignancy in these moles was more theoretical than actual.

9. ECZEMA SEBORRHEICUM. PRESENTED BY DR. W. P. BOARDMAN.

An unusual example of seborrheic eczema of six months' duration. The patient has been under treatment for some time. The process is most marked in scalp, axillae, umbilicus and in genito-crural region. The hands have been the most resistant to treatment, growing worse under salicylic acid and resorcin, but have improved slightly under crude coal tar ointment. In the axillae the most typical areas appear, sharply outlined, greasy and scaling.

10. LUPUS VULGARIS. PRESENTED BY DR. T. W. THORNDIKE.

The patient was exhibited to illustrate a most gratifying result obtained by the use of liquid air. Twenty-five applications have been made. The disease was extensively ulcerative when first seen. The exhibitor regarded this as the first successful result he had observed after the use of liquid air.

A discussion followed in regard to the respective values of liquid air and CO₂ snow, and in conclusion Dr. Thorndike said that he preferred CO₂ snow because he could mold it to the shape of the lesion, and could feel under his fingers exactly what he was doing, and, in addition, liquid air was costly and CO₂ snow cheap.

11. XERODERMA PIGMENTOSUM. PRESENTED BY DR. F. J. KEANY.

The man, now twenty-eight, was born in Russia. The first lesions appeared when he was three and a half years of age, and the patient presented all the classical symptoms of the disease. In addition to the pigment and atrophy and teleangiectases, some of the lesions have become epitheliomatous and have been removed surgically. The brother is in a similar condition.

Dr. WHITE remarked upon two extraordinary, apparent facts. The disease is apt to occur in two members of the same family, and affects two broth-

ers or two sisters, but never in his knowledge a brother and a sister.

12. SYPHILIS OR CARCINOMA OF THE TONGUE. PRESENTED BY DR. T. W. THORNDIKE.

The man was infected with syphilis twenty-five years ago, and at the time received extensive treatment. About 1912, inguinal adenitis developed. At the same time his tongue began to thicken and became fissured and roughened. Fifteen months ago the tongue began to hypertrophy, and at the present time one can see its marked sclerosis and appreciate the possible question of malignancy. Severe pain, of a nocturnal character, radiating around occipital and temporal regions, is now a marked feature. There have been many positive Wassermann tests. The tongue does not react to mercury or to salvarsan; intramuscular injections and iodide of potash cannot be tolerated, for within twenty-four hours swelling of the submental glands develops. A biopsy was made at another institution and the diagnosis of carcinoma made. We are not willing, in this hospital, to say that the disease is carcinoma, nor are we willing to say that it is lues. We even go so far as to say that it is not "chronic inflammatory", but think there is a secondary complication superimposed here. In this hospital mercury and x-rays have been employed and the glands have gone down remarkably under the treatment.

DR. ABNER POST stated that the patient had had negative as well as positive Wassermann tests. In this case the two pathologists do not agree and the Wassermann tests do not agree. Pain, however, radiating through the ear, is much more common during malignant disease than during syphilis.

Many of the members were inclined to agree with Dr. Post that carcinoma was present.

The following cases were presented by Drs. C. J. WHITE, F. S. BURNS, E. L. OLIVER, J. H. BLAISDELL and L. J. CUMMINS.

1. URTICARIA PIGMENTOSA.

A child of five months, whose cutaneous eruption began at the age of six weeks. The present lesions are distributed over the entire trunk, face, scalp, and even on palms and soles. The mother says the outbreak first appears as bright red maculo-papules, which finally subside, leaving brown pigmented macules. The eruption does not itch. The lesions vary in size from a pea to an almond, and are buff to chocolate-brown in color. The child is breast-fed and appears to be perfectly well. The mother states that no medicine has been given to the patient. All in all, the baby presents as perfect a picture of the disease as one could wish to see.

DR. WHITE stated that while the mother was carrying the child, and after its birth as well, she had eaten a great many oranges. Assuming that an excess of acid in the diet was a probable factor in the prolongation of urticarial conditions, could not this rather excessive ingestion of oranges on the mother's part be a factor in the child's present condition.

2. ERYTHRODERMIE PITYRIASIQUE EN PLAQUES DISSÉMINÉES.

Duration, four years. The process started with a small lesion on the chest, and has continued steadily, without intermission, ever since. Today the process is present over the chest, abdomen, inner aspect of arms, inner aspect of thighs and above the

buttocks. The characteristic lesion is one to two inches in diameter, and is a sharply defined, slightly elevated, yellowish red, round or oval area. At first appearance it closely resembles an urticarial wheal. There is no distinct scaling, although the lesion is distinctly seborrheic in type. Mild itching is present.

3. A CASE FOR DIAGNOSIS.

The process, now three years old, involves both hands and extends somewhat above the wrists, being more extensive on the left than on the right. The patient states that the condition began on the center of the palms, and then slowly spread thence to other portions of the hand. In the palms there is a moderate amount of keratotic thickening, the surface of which is stippled with a profusion of small pearls. Elsewhere the outbreak consists of a moderately bright erythema, whose borders almost everywhere are abrupt. In places there also seems to be slight infiltration and a little dry scaling. The patient complains of very little sensation, and there are no recognized constitutional symptoms. On the soles of both feet, extending half to one inch on the lateral surface, there is a similar erythematous process, also with well demarcated edges. Here the patient complains of some itching and mild burning. According to the woman's story, she took no drugs before the skin affection developed. In differentiation we may consider dermatitis medicamentosa and pellagra as possibilities.

DR. TOWLE remarked upon the keratotic condition of the palms, and asked if the woman did much sweeping. He believed that some systemic process, possibly connected with the sweat ducts, lay at the bottom of the trouble.

DR. BURNS replied that there was no history of an occupational factor in the case.

DR. WHITE believed the disease to be an arsenical keratosis. To be sure, the patient had denied the ingestion of any drugs, but such a condition could be produced by the long-continued absorption of arsenic, while on the other hand, no other theory would explain so well the cutaneous appearances present.

4. VITILIGO?

The roughly symmetrical eruption, now eight months old, is found on the trunk and thighs, sparing the face, arms and lower legs. It consists of sharply defined, large and small, grey-brown areas, without any distinct elevation or appreciable thickening. The lesions on the back, neck and thighs are similar to those described above. On the abdomen, extending to flanks, are apparently somewhat similar areas, which are distinctly lacking in the normal pigment of the skin, resulting in a curious mottled appearance of the body. Certain lesions about the breast and on the flanks have a distinctly violaceous surrounding border. The lesions on the thighs and shoulders show the slightest possible intimation of thickening, but in no place is there distinct hardening or sclerous change, as the first appearance of the lesions would suggest. The patient complains of mild itching, and states that the process started on the chest and developed within a few weeks over the other affected parts of the body. No lesion that has appeared has entirely disappeared. The young woman has been to no physician, and has applied no treatment, internal or external.

Dr. WHITE felt that the case belonged more to the group of atrophies and pigmentary changes of the skin than to the sclerous groups.

5. LUPUS ERYTHEMATOSUS?

The patient was a boy of five years, and for the previous eighteen months the "butterfly" area of his face and nose had been very slightly thickened, somewhat erythematous, furfuraceously scaling, and very sharply defined from the surrounding normal skin.

On account of the child's age one was reluctant to call the disease lupus erythematosus, but a careful examination of the scales and lanugo hairs had failed to disclose the presence of any mycelium or spores, so that the possible, though not probable, question of ringworm was ruled out.

6. LUPUS ERYTHEMATOSUS.

Duration of process, fifteen years. The patient says that the eruption disappears every winter and returns in summer, but such a story is highly incredible. Today, the whole face and back of the neck, the whole outer aspect of both forearms and the whole top of the scalp show a finely scaling or glazed, atrophic condition as white as mother of pearl where not dotted or blotched with active, scarlet, somewhat elevated areas. The scalp, in the affected parts, is totally denuded of hair.

7. DERMATITIS HERPETIFORMIS.

A boy of six, whose case had been carefully studied in the skin ward. He was not up to the mark mentally; he was rather underfed; he had poor teeth, but the x-ray had disclosed no pus pockets in their roots nor in the hollow bones of the face; he had adenoids and trouble with the turbinate bones of the nose (which were to be attended to shortly); he had a "white" count of 16,000, but curiously enough never an eosinophilia above six per cent. The outbreak was periodic, but consistently of the multiform rather than the herpetiform type, and always most picturesque and most strikingly symmetrical. Occasionally there was an isolated bulla, perhaps one-half inch in diameter, but the essential lesion was a macule. These round macules appeared, for the most part, on the trunk, and soon developed a raised, probably microscopically vesicular, red periphery. Then arose rapid, eccentric growth, so that in a few days a most extraordinary picture was formed, and the whole torso was covered with these now huge circles and polycyclic figures where coalescence had occurred. Such an attack would require perhaps two to three weeks for the completion of its cycle, and was not apparently influenced, and certainly not prevented, by arsenic. Sulphur ointment externally would unquestionably, where applied, check the growth of the otherwise rapidly spreading circles, but in the dry atmosphere of winter such treatment caused painful desiccation and furfuration of the skin and had to be abandoned.

8. NAEVUS VASCULARIS.

The patient presented a "port-wine mark" over the whole right side of the face. This was at first treated in several areas with radium, but the effect

produced was not very satisfactory. Then Dr. Oliver had used the Kromayer lamp, one application of forty minutes, and as a result there was a distinct paling in this treated area, although the height of the improvement had not yet been reached.

Dr. Oliver was asked how much reaction he got, and replied, "Not more than a very severe sunburn, a subsequent blister for three or four days. The reaction does not appear until the next day, or at the earliest, in six hours."

9. LYMPHANGIOMA CIRCUMSCRIPTUM.

A young girl presented over and in front of her right shoulder band-like groups of very delicate, superficial, elevated, vesicular chambers, pinhead in size, some yellow and translucent, others purple-red and opaque, suggesting the individual elements of thimble-berries. From neither type could one express the fluid or the color. The lesions appeared two to three years after birth, but remained quiet until puberty. At first the patient was treated with CO₂ snow with rapid and marked success, but as she objected to the ensuing reaction radium was tried. This method proved effective but, of course, was slower; but as the patient preferred this treatment it was pursued, and the process was slowly disappearing under the radium exposures. It is worth recording in this instance that the areas treated by artificial snow showed a tendency to recur, while those subjected to radium had been absolutely cured.

10. DERMATITIS HERPETIFORMIS.

An excellent example of the long continued, grouped, papular type, where one never sees a vesicle, but where the chronicity and periodicity and seeming incurability are noteworthy, and where the typical recurring leukocytosis and eosinophilia are well pronounced.

11. LICHEN PLANUS.

A very perfect example of the disease in a much overworked and mentally harassed woman of sixty. The eruption was remarkable for its great abundance and its unusual chronicity and tenacity. Several doctors had treated the patient with all the known and recognized "specifics," but the eruption had failed to yield one iota to this well directed therapy.

12. DERMATITIS HERPETIFORMIS. PRESENTED FOR DR. BUFFORD BY DR. BLAISDELL.

Duration, four years. Patient has had eight successive attacks of the disease during this time, with intervals of several weeks between the outbreaks. Today, he shows over the entire body typical, grouped lesions consisting of vesicles, ruptured and unruptured, on erythematous bases; there is also a great deal of crusting and excoriation. This patient has had two strongly positive Wassermann tests at intervals of four months, but denies syphilis both by history and symptoms.

At the close of the meeting Dr. T. W. Thorndike gave a lantern demonstration of congenital syphilitic bones as revealed by the x-rays, and exhibited a Greek leper from the Boston Detention Hospital.

CHARLES J. WHITE, *Secretary*.

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THE EFFECT OF WAR UPON AN ARMY MEDICAL CORPS.

On March 9 of this year we commented in these columns upon the hearings before the Military Committee of the House of Representatives. In regard to the testimony of General W. C. Gorgas before this Committee, in which he asked for seven medical officers for every 1000 enlisted men, the Washington, D. C., *Herald* says. "In reply to this argument, the Senate conferees cite the fact that none of the European armies previous to the war had over four medical officers to a thousand enlisted men."

The writer in the *Herald* does not mention the fact that England has had to strip her home territory to supply the army with medical officers and to call on the United States in addition. He does not mention the fact that the Surgeon-General of the French army called to the atten-

tion of the French general staff that the army was very short of medical officers, and that he was unwilling to accept the responsibility for the results unless the numbers he called for were allowed him. Both of these facts were available in the quotations from British and French sources given at the hearing.

The quotations from the report of the Sanitary Committee of the French Chamber of Deputies concerning the conditions existing in the French army in 1913-14, the report being made to the Chamber by M. LaChaud, the chairman of the Committee, show conditions that should not have been possible in any army, and this at a time when the line officer of the French Service was preparing for the present war. The war following very soon, this protest smouldered until August, 1915, when it broke into flame in the French Chamber of Deputies and Senate. This apparently had considerable influence in the defeat of the French Ministry in the fall of 1915.

The Freycinet Commission, which was appointed by President Poincaré in 1914 and which had taken an active part in this protest, was re-formed and two of its members taken into the new ministry (M. M. Freycinet and M. Bourgeois). The reports of these Commissions and the discussions in the Chamber of Deputies show the results which follow neglect of the sanitary side of army questions and the necessity for careful study of these problems in time of peace in preparation for the difficulties of war.

On page 638 of the Committee Report, paragraph 4, General Gorgas says:

"It is always an easy matter during the actual period of hostilities to obtain legislation for increasing the various branches of the military establishment; but to increase a technical staff like the Medical Corps when war becomes imminent, or after it has begun, does not meet the actual needs of the situation, for the new men entering the corps from civil life, while they may be wholly competent as practitioners of medicine and surgery, are without the special training necessary to enable them to solve the problems of medico-military administration and properly to perform the duties of the medical officer."

We were much pleased to note that H. R. No. 2766 (the Hay bill) calls for 7 medical officers per 1000 enlisted men, as recommended by General Gorgas. We sincerely hope that the conferees will allow this provision to remain in the law. It is quite evident by the history of the present war that they and more will be needed once the United States becomes involved in war.

For the United States deliberately to calculate on receiving the charity of its citizens is unworthy of a great nation. The United States should prepare as deliberately for the care of its sick and wounded as it does for the destruction of its enemies. We do not agree with Miss Boardman when she says, on page 1222, "*Mr. Chairman, in war it is impossible for the medical service of any army, however efficient, to meet the demands that will be made upon it.*"

The United States should make provision for the care of its sick and wounded in any future wars in such a way as to render a criticism of its attitude impossible, no matter how just such a criticism of its past positions may be.

PREDISPOSING CAUSES OF TUBERCULOSIS.

For a practical people such as we Americans are supposed to be, perhaps the most certain way of arousing public interest in questions relating to the health of the laboring classes is to tell how much it costs the State to care for the victims of advanced disease. We are beginning to appreciate the fact that the expenditure of comparatively small sums in prevention may save much greater amounts in the long run. Information upon this most important aspect of medicine is accumulating, and gradually, here and there, appear evidences of progress.

An excellent study along the line of preventive medicine has been carried out by Robinson and Wilson of the United States Public Health Service.* These investigators, at the request of the Board of Health and the Anti-Tuberculosis League of Cincinnati, undertook a survey of conditions in that city to determine, if possible, the reason for the abnormally high death rate from tuberculosis. The research consumed more than one year; 19,932 employees from 38 industries were examined and 154 establishments were inspected. Analysis of the predisposing causes of tuberculosis was made in cases of that disease found among employees, in those reported to the board of health and among inmates of the municipal tuberculosis hospital. This analysis was supplemented by a general survey of housing and economic conditions, of climatic conditions, of the prevalence of other

diseases as a predisposing cause, and of the character and rate of growth of the population.

The report contains so many interesting and valuable observations that it is difficult to choose particular ones for comment. The analysis of predisposing causes most in evidence in 442 cases of tuberculosis investigated is instructive: Cases in which there was a history of tuberculosis in the family, 32.4%; cases in which poverty and poor housing were most in evidence, 9.7%; cases in which alcoholism, venereal disease and excesses were most in evidence, 10.8%; cases in which other diseases and injuries were most in evidence, 8.4%; cases in which occupation hazard or working conditions were most in evidence, 18.1%; cases in which none of the foregoing factors was in special evidence, 20.6%.

Infection from a member of the family is seen to be a very frequent cause of the disease. To prevent this, the writers urge sanatorium treatment for early cases, segregation for open cases, and the education of the family in prophylactic measures. They consider the consumptives who frequent cheap lodging houses the most dangerous class, and advise their frequent medical examination and segregation. In regard to the predisposing causes found in industries, the writers found that marble and stone workers run the greatest risk of developing tuberculosis. They believe, however, that "in the majority of instances the hazard was not inherent in the occupation itself, but was due to the bad hygienic and sanitary conditions obtaining." Housing conditions and poor economic conditions generally appear to be responsible for a larger percentage of cases than would be suggested by the table. These factors enter into the problem of tuberculosis in a large proportion of the cases, even when a more definite predisposing cause can be found. The recommendations which follow this report seem to us so sane and so practicable that we print them in full:

They are:

1. Erection of a sanatorium for the treatment of incipient cases.

2. Increased segregation of advanced cases, and their detection by frequent medical examination of lodging-house inmates.

3. A more strict surveillance over families in which tuberculosis exists, by employment of all-time physicians for making frequent visits and medical examinations of other members of the family.

4. Institution of measures whereby a more

* Tuberculosis Among Industrial Workers, Public Health Bulletin No. 73, March, 1916.

accurate knowledge can be had of the whereabouts of all reported cases, by the passage of an ordinance by which the city authorities are kept informed of the removals of all families and perhaps some form of colonization of the lodging-house class.

5. By having accurate records of all removals, the disinfection of houses and rooms can be more thoroughly carried out, and by using mechanical cleansing and scrubbing with antiseptic solutions will be more efficiently performed.

6. Increased detection of both incipient and advanced cases by medical examination of industrial workers, either by physicians from the health department or physicians employed jointly by the manufacturers and workmen.

7. Improvement in sanitary and hygienic conditions in many work places, especially as regards ventilation, time and manner of cleaning floors, toilets and wash rooms, and promiscuous spitting.

8. Institution of State industrial insurance, by which the worker can obtain the necessary medical relief, rest, etc., and the family be provided for while the remedial measures are being carried out.

9. The improvement of home conditions by providing sanitary homes in the suburbs, with reasonable rent and cheap and rapid transit between these homes and the work places.

10. Revision of the building code, with more rigid requirements in regard to old houses and converted tenements and placing tenement house inspection under the health department, with an increase in the number of inspectors."



INDUSTRIAL HEALTH INSURANCE.

IN the issues of the JOURNAL for January 6, February 24 and April 6, 1916, we have commented editorially on the general subject of compulsory industrial health insurance and, in particular, on a bill, fostered by the American Association for Labor Legislation, which has been under consideration at the present session of the Massachusetts General Court. Whatever the opinion upon the general provisions of this bill, it appears that its phraseology is not yet satisfactory, and a new draft of the measure has been suggested, printed and recently circulated. In this draft the particular attention of physicians is directed to Sections 8 to 14 inclusive, the text of which at present has been revised as follows:

"Sect. 8. *Beginning of Right.* Insurance, with the exception of maternity benefits, begins with the day of membership. The maternity benefits shall be payable to any woman insured

against sickness for at least six months during the year preceding the confinement, or to the wife or widow of any man so insured.

"Sect. 9. *Medical, Surgical, and Nursing Attendance.* All necessary medical, surgical and nursing attendance and treatment shall be furnished by the carrier from the first day of sickness during the continuance of sickness, but not to exceed twenty-six weeks of disability in any consecutive twelve months. In case the carrier is unable to furnish the benefit provided for in this section, it must pay the cost of such service actually rendered by competent persons at a rate approved by the Commission.

"Sect. 10. *Medical Service.* The carriers, subject to the approval of the Commission, shall make arrangements for medical, surgical, and nursing aid by legally qualified physicians and surgeons, and by nurses or through institutions or associations of physicians, surgeons, and nurses. Provision for medical aid shall be made by the carriers by means of either:

"1. A panel of physicians to which all legally qualified physicians shall have the right to belong, and from among whom the patients shall have free choice of physician, subject to the physician's right to refuse patients on grounds specified in regulations made under this act; provided, however, that no physician on the panel shall have on his list of insured patients more than 500 insured families nor more than 1,000 insured individuals;

"2. Salaried physicians in the employ of the carriers, among which physicians the insured persons shall have reasonable free choice;

"3. District medical officers, engaged for the treatment of insured persons in prescribed areas;

"4. Combination of above methods.

"Sect. 11. *Medical Officers.* Each carrier shall employ medical officers to examine patients who claim cash benefit, to provide a certificate of disability, and to supervise the character of the medical service in the interests of insured patients, physicians, and carriers.

"Sect. 12. *Medical and Surgical Supplies.* Insured persons shall be supplied with all necessary medicines, surgical supplies, dressings, eyeglasses, trusses, crutches and similar appliances prescribed by the physician, not to exceed \$50 in cost in any one year.

"Sect. 13. *Hospital Treatment.* Hospital or sanatorium treatment and maintenance shall be furnished, upon the approval of the medical officer of the carrier, instead of all other benefits (except as provided in Section 16), with the consent of the insured member, or that of his family when it is not practicable to obtain his consent. The carrier may demand that such treatment and maintenance be accepted when required by the contagious nature of the disease, or when in the opinion of its medical officer such hospital treatment is imperative for the proper

treatment of the disease or for the proper control of the patient. Cash benefit may be discontinued during refusal to submit to hospital treatment. Hospital treatment shall be furnished for the same period as cash benefit. This benefit may be provided in those hospitals with which the funds and societies have made satisfactory financial arrangements which have met the approval of the Social Insurance Commissioners, or in hospitals erected and maintained by the funds and societies with the approval of the Commission.

"Sect. 14. *Arbitration Committee.* All disputes between the insured and physicians, or between friends and physicians, concerning medical benefits shall be referred to special committees composed of representatives of the interests concerned, with an impartial chairman appointed by the Commission, with an appeal to the Commission."

There is little to add to our previously expressed editorial opinion on the general aspects of this subject. Legislative action upon it is unlikely to be taken during the present season. A careful consideration of the provisions of the bill as relating to the medical profession is, therefore, earnestly urged upon all physicians in order that they may be prepared to form judicial opinions prior to the reopening of the subject in the next legislature.

RECENT MEDICAL LEGISLATION.

IN the JOURNAL for May 4, 1916, we commented editorially upon the resolution introduced by Senator Works of California, which states that inasmuch as the American Medical Association is a national organization of physicians and surgeons of one school of medicine only, whereas the Public Health Service of the United States is intended to represent all classes of people, of all medical or non-medical beliefs, in national and interstate affairs, "Be it resolved by the Senate and House of Representatives of the United States of America, in Congress assembled, that it shall be unlawful for any officer or employee of the Public Health Service of the Government to be or become a member or officer of, or in any way connected with, any medical or private health association or organization of any kind."

It is difficult for those of us of the "one school of medicine" represented by the American Medical Association to characterize by any

other term than absurd this resolution of Senator Works. One need only to point out that the present Public Health Service of the United States, the quarantine laws, control of epidemics, sanitary regulations and the passage of laws aimed at the securing of pure food, including milk—in short, all the laws of hygiene and sanitation—are the result of the activities of those who have believed as the "one school of medicine" has believed. In seeking to divorce the interests of the Public Health Service and the great body of "regular" physicians, Senator Works really repudiates all of the advances hitherto made in the cause of public health.

This resolution is now before the Committee on Public Health and National Quarantine, of which Senator Weeks of Massachusetts is a member. We cannot believe that this committee will report favorably such an iniquitous piece of legislation.

THE TESTING OF VISION AND HEARING IN THE PUBLIC SCHOOLS.

IN the issue of the JOURNAL for May 25 we published a report by Dr. William H. Devine, director of medical inspection in the Boston public schools, on physical examinations of pupils made in these institutions during the past winter. In another column of the present issue of the JOURNAL we publish a further communication from Dr. Devine on the tests of vision and hearing made in the Boston public schools during the decade 1907 to 1916. The statistics for this period are presented in tabular form, noteworthy points being the decline in the percentage of defective vision, and especially of defective hearing during this decennium. Attention is called to these important and interesting results of a valuable work in child welfare which is the direct outgrowth of medical inspection.

MEDICAL NOTES.

MEDICAL MEETINGS AT DETROIT.—The sixty-seventh annual session of the American Medical Association is to be held at Detroit, Mich., next week from June 12 to 16, and in conjunction with it the sessions of its fifteen scientific sections and of several non-affiliated organizations. Among the latter may be noted particularly the

forty-first annual meeting of the American Academy of Medicine, from June 9 to 12, and the eighteenth annual meeting of the American Proctologic Society on June 12 and 13. Complete announcement and programs were published in the *Journal of the American Medical Association* on May 6, to which members of the Massachusetts Medical Society and other physicians purposing to attend any of these meetings are referred. The subjects for special consideration by the American Academy of Medicine are the relation of legislation to the practice of medicine, and the relation of the science of medicine to legislative enactment.

PHYSICIANS FOR SERVICE IN CHINA.—On May 5, an appeal was issued by the Chinese Medical Board to the medical profession of Philadelphia to supply fifty physicians and surgeons for immediate service at hospitals in China. It is believed that the furnishing of this unit will be undertaken by the College of Physicians of Philadelphia.

TRELOAR CRIPPLES' HOSPITAL AND COLLEGE.—The recently published first medical report of the Treloar Cripples' Hospital and College at Alton, Hampshire, England, presents a record of the work of this institution by its medical superintendent, Dr. H. J. Gauvain. There is an introduction by Lord Moulton descriptive of the origin and purposes of the Hospital. The report is well illustrated with fifty-two figures representing aspects in the treatment of orthopedic cases. In conclusion it presents a review of the work of the Hospital from its foundation in September, 1908, until March 31, 1915. During this time, 1267 patients were admitted of whom 506 had tuberculous disease of the spine and 435 of the hip.

BUBONIC PLAGUE IN INDIA.—During the week ending February 5, there were in the whole of India 6628 deaths of bubonic plague. Bombay Presidency and Sind and the United Provinces account for 1721 and 1628, respectively. Other provincial figures are: Madras Presidency, 431; Bengal, 3; Behar and Orissa, 602; Punjab, 65; Burma, 350; Central Provinces, 703; Mysore State, 162; Hyderabad State, 874; Central India, 80; and Kashmir, 6.

BRITISH MEDICAL GIFTS.—It is announced that Mr. Arthur du Cros of Hastings, England, has made a gift of £7000 to the extension fund of the London School of Medicine for Women, completing the fund of £30,000 needed for endowment.

It is further announced that Sir Alexander R. Simpson, formerly professor of obstetrics at the University of Edinburgh, has bequeathed the museum of his uncle, the late Sir James Young Simpson, discoverer of chloroform as an anesthetic, to the University of Edinburgh.

NATIONAL COMMITTEE FOR THE PREVENTION OF BLINDNESS.—The first annual report of the National Committee for the Prevention of Blindness, recently published, covers the work of that organization and includes the seventh annual report of the New York State Committee for the Prevention of Blindness. The Committee states that it represents a need strongly felt in many sections of the United States for a bureau of information and advice, and for leadership in the movement for the conservation of vision. The organization of the society consists of a board of thirty directors with a managing director as executive officer. A secretary and a field secretary carry on the active work.

"The secretary, Miss Van Blarcom, has kept in touch with the workers for control of inflammation in the eyes of the new-born, that cause of needless blindness which has been credited with responsibility for more than one-fourth of the loss of vision of children; and by correspondence and articles in the daily and other periodical press, as well as by personal service in public lectures and private conferences, has contributed to the efforts constantly being made to eradicate it. In like manner she has labored for the elimination of blindness by poisoning from wood alcohol and for the improvement of the status of midwifery.

"The field secretary, Mr. Berry, has made special studies in the work of preventing blindness from trachoma and from eye injuries in the industries, and in the field of faulty and harmful illumination. He, too, has conducted a large correspondence and rendered personal services, the latter more particularly in the states of Kentucky, Tennessee, and North Carolina. Publications of the Society have reached a circulation of 50,000 copies, and other facilities for educational propaganda have been liberally used; they are in intimate touch with work in a score of states and especially close to that in five of them.

"While an integral part of the National Committee, the New York State Committee for the Prevention of Blindness maintains its identity and confines its attention to its specific field. The financial support of the State Committee's work is a part of the expenditures of the National Committee."

BIRTH OF CAESAREAN TRIPLETS.—Report from Omaha, Neb., states that on May 18, a resident of that city, wife of a local farmer, was delivered of living triplets by Caesarean section. The patient was a primigravida, 23 years of age. The children are all boys and are said to appear vigorous. Their weights are not stated. It is believed that this is the first reported instance of the birth of Caesarean triplets. We are not yet informed whether the diagnosis of multiple pregnancy was made prior to operation.

AMERICAN SOCIETY FOR THE CONTROL OF CANCER.—The annual meeting of the American Society for the Control of Cancer was held in New York City on May 18. The following officers were elected for the ensuing year: Dr. George C. Clark of New York, president; Dr. Llewellys F. Barker, Baltimore; Dr. Arthur Kenn Beavan, Chicago; Dr. Lewis W. McMurtry, Louisville, and Dr. Edward Reynolds, Boston, vice-presidents; Thomas M. Debevoise, New York, secretary; Howard Bayne, New York, treasurer, and Curtis E. Lakeman, New York, executive secretary.

The following new directors of the society, in addition to those now serving, also were elected: Professor C. E. A. Winslow, New Haven, Conn.; Dr. Charles J. Hastings, Toronto; Dr. M. F. Engman, St. Louis; Dr. Robert B. Greenough, Boston; Dr. Joseph Ransohoff, Cincinnati, and Dr. Palmer Findley, Omaha.

TYPHUS FEVER IN TEXAS.—In the weekly report of the United States Public Health Service for May 19, it is stated that between March 18 and May 1, a total of 41 cases of typhus fever had been reported in El Paso, Texas, 15 at Laredo, Texas, and 3 at Conejo, Texas. During the same period there also occurred 6 cases of the disease in New Mexico and 3 in Arizona.

EUROPEAN WAR NOTES.

CHOLERA AND TYPHUS IN HUNGARY.—Report from Austria-Hungary on May 19, states that during the week ended April 1, 1916, two cases of typhus fever occurred in Budapest. Sporadic cases of Asiatic cholera have also occurred in this city during the winter, the last two fatal cases having been in January. Recrudescence of cholera is to be expected during the summer season. Sporadic cases of typhus fever have also occurred in several of the German prison camps, the largest number of cases being thirty-seven in Saxony, and twenty-one at Königsberg during the first quarter of 1916.

MEDICAL ASPECTS OF THE DUBLIN REVOLT.—Recently received issues of the English medical journals contain graphic accounts of the medical aspects of the Dublin revolt of April 24, particularly as it affected the work of the ten general hospitals which were supplemented by the military hospital and the Dublin Castle Red Cross Hospital.

"Many medical men were absent for a brief holiday when the outbreak occurred, but most of them took whatever means was in their power to return to what they considered their post of duty. As no trains were running into Dublin the journey had to be made by motor-car, or, in some cases, by relays of post-car. Most of those who were in Dublin on Easter Monday lost no time in getting to their various hospitals, where

they remained without intermission or release until the following Saturday. Transit through the streets during the week was in all cases dangerous, and in many impossible. One hospital was invested by the insurgents, who kept several members of the staff as prisoners, carrying in their wounded for treatment and removing them immediately, whatever their condition. From Monday to Saturday the various medical staffs worked almost incessantly; the house of the College of Surgeons of Ireland in St. Stephen's Green was made to serve as the chief ambulance dépôt or hospital of the insurgents. A number of wounded were also taken to the Royal City of Dublin Hospital in Baggot Street, which runs into St. Stephen's Green. The first serious street fighting took place on Tuesday, April 25th, at the corner of Pembroke and Lansdowne Roads, where the rebels had seized a doctor's house, from which the troops coming from Kingstown were fired on. When the house was captured in the evening the bodies of nineteen Sinn Feiners were found within. On the same day the insurgents seized an ammunition shop, from which they had Trinity College under close and direct fire. The College was occupied by soldiers, and on Wednesday, April 26th, a field gun was brought to the roof of the College and the ammunition shop blown to pieces. In spite of all this, a term examination was carried on with the usual exactness within the walls of the College. The house of the College of Surgeons seems to have been one of the last buildings held by the insurgents, and on April 30th, there were some 200 wounded men in the building.

"It is impossible to suggest any estimate of the number of casualties dealt with during the week. Some two hundred and fifty dead bodies lay in the hospitals at the end of the week, and there were probably at least as many more outside. The casualties must have run into thousands. The majority both of deaths and lesser casualties was probably among harmless civilians who had the misfortune to be resident in the neighbourhood of the strongholds of the insurgents."

No fatalities were reported among medical officers, but two surgeons, Major Black and Captain McCullagh, both of the Royal Army Medical Corps, were severely wounded while in the discharge of their duties.

PERCENTAGE OF RECOVERY AMONG GERMAN TROOPS.—Report from Berlin, by Dr. von Schjerning, states that of sick and wounded soldiers treated in the German field hospitals, 86.6 per cent. are able to return to service, and of those treated at base hospitals in Germany, 90.1 return to service. The death rate is stated to be only 1.5 per cent. of wounded and sick. The total number of army nurses engaged in active service is 6800.

COST OF DRUGS IN ENGLAND.—In conjunction with the nominal increase in the cost of drugs in the United States since the outbreak of the war, it is interesting to note the corresponding increase in the cost of drugs in England. The following table indicates how many times more expensive twenty commonly prescribed drugs now are in that country than before the war.

Phenacetin	26	Salicylic acid	20
Permanganate of potash	27	Chlorate of potash ..	7
Aspirin	25	Cocaine	7½
Antipyrine	12	Quinine	3
Potassium bromide ..	16	Veronal	3
Cod liver oil	11	Sulphonal	5
Antifebrin	11	Citric acid	2
Thymol	3½	Tartaric acid	3¼
Cream of tartar ..	2	Calomel	2½
Carbolic acid	6	Caffeine	3½

"In most cases the cause of these remarkable advances is that before the war, England was almost entirely dependent upon Germany for its supply of such popular drugs as phenacetin, aspirin, antipyrine and so on. A few of them are now being made in Great Britain, but the raw materials from which they are manufactured are in many cases used for the production of explosives, the quantity available is severely restricted, and prices consequently remain at a high level."

SHIPMENT OF SALVARSAN FROM GERMANY.—Report from New York states that on May 25, a shipment of salvarsan valued at \$500,000 was received in that port from Germany. This shipment is the first to enter this country since the outbreak of the war, and its arrival is the result of negotiations between the United States Department of State and the German government. The latter issued a special order directing the shipment, and the consignment of the drug was sent through Holland and transported on a Dutch steamer under assurance from the British and French governments that it should not be confiscated.

APPEAL OF SURGICAL DRESSINGS COMMITTEE.—The surgical dressings committee of the National Civic Federation has recently issued the following appeal for additional funds to enable the continuance of its work in preparing surgical supplies for the Allied army.

"The work of the Surgical Dressings Committee, which more than a year ago began to send sterilized surgical dressings abroad for wounded soldiers of the Allied armies, has, in the past winter, quite outgrown all expectations. That the dressings are excellently prepared, and that the affairs of the committee are managed economically and efficiently, are testified to by the eminent surgeons and financiers whose names follow. With constant additions to the branches through New England, under the Surgical Dressings Committee, the demand for dressings more than keeps pace, and the com-

mittee, determined not to disregard these demands of suffering humanity, makes the following appeal to the public for further financial support:

"To provide for the continuance of our work—the sending of surgical dressings to the war hospitals of the Allies, the demand for which is constantly increasing—we appeal for further funds.

"To justify this appeal we print the opinions of our surgeons' advisory committee and of our financial advisers:

"We have no hesitation in indorsing the work of the Surgical Dressings Committee. The dressings made are always of the first order of excellence, and, as some of us know from personal experience, are perfectly adapted for use in the war hospitals abroad.

"Harvey Cushing, M.D.,

"John W. Elliot, M.D.,

"Robert B. Greenough, M.D.,

"Charles Allen Porter, M.D.,

"Hugh Williams, M.D.

"We have kept in constant touch with the financial affairs of the Surgical Dressings Committee, and are satisfied that the management is efficient and economical.

"George Wigglesworth,

"Walter C. Baylies,

"Arthur Adams.

"We are coöperating with the Red Cross and the Special Aid Society for American Preparedness in a number of ways—principally by teaching the making of surgical dressings. This coöperation increases the output, both for sending to the war hospitals abroad, and for possible use at home.

"Since October, the number of voluntary workers at our quarters in the Peter Bent Brigham Hospital, has increased to 740; and 87 branches throughout New England have been organized. In behalf of them all, we wish to thank those whose generosity has given them the opportunity to serve a cause with which they sympathize so keenly.

"Our shipments abroad of surgical dressings from Nov. 1, 1915, to May 1, 1916, have been 1,169,067, increasing from 96,962 in November to 251,155 in April.

"Checks should be made payable to the Surgical Dressings Committee, and sent to the Old Colony Trust Company, Boston.

"Surgical Dressings Committee, National Civic Federation, Women's Department, New England Section."

MENINGITIS AMONG BRITISH TROOPS.—During the past winter, cerebro-spinal meningitis has been considerably epidemic in certain camps of British and Canadian troops in England. Further data on this subject will appear in next week's issue of the JOURNAL.

WAR RELIEF FUNDS.—On June 3 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$123,802.31
Allied Fund	113,787.67
French Wounded Fund	84,927.11
American Ambulance Fund	76,489.58
British Imperial Fund	56,569.04
French Orphanage Fund	52,354.08
Armenian Fund	43,195.53
Army Huts Fund	38,883.50
Polish Fund	35,905.21
Surgical Dressings Fund	32,008.67
Facial Hospital Fund	21,054.25
Italian Fund	18,222.56
French Refugees' Fund	12,241.50
Cardinal Mercier Fund	6,542.50
Belgian Tobacco Fund	2,495.18

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending June 3, 1916, there were 239 deaths reported, with a rate of 16.39 per 1,000 population, as compared with 208 and a rate of 14.49 for the corresponding week of last year. There were 35 deaths under 1 year, as compared with 27 last year, and 74 deaths over 60 years of age, against 71 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 60; scarlet fever, 42; measles, 271; whooping cough, 28; typhoid fever, 3; and pulmonary tuberculosis, 47.

Included in the above were the following cases of non-residents: Diphtheria, 17; scarlet fever, 16; measles, 1; and tuberculosis, 10.

Total deaths from these diseases were: Diphtheria, 3; scarlet fever, 4; measles, 4; whooping cough, 1, and pulmonary tuberculosis, 24.

Included in the above were the following deaths of non-residents: Diphtheria, 1; scarlet fever, 2; tuberculosis, 1.

WORKMEN'S COMPENSATION AND SOCIAL INSURANCE.—Before adjourning, June 2, the Massachusetts Legislature appointed the following Recess Committee to consider Workmen's Compensation insurance rates: Senators Cavanagh of Everett, Jackson of Lynn, and Sheehan of Holyoke, with Representatives Kennard of Somerville, Abbott of Haverhill, Faxon of Fitchburg, Kent of Pittsfield, Sullivan of Ward 19, Boston, and Garrity of Worcester. Also the following Recess Committee to consider Social Insurance: Senators Farnsworth of Leominster, and McLane of Fall River, with Representatives Catheron of Beverly, Bowser of Wakefield, Woodill of Melrose and Morris of Ward 15, Boston.

MASSACHUSETTS HOSPITALS FOR CONSUMPTIVES.—The ninth annual report of the trustees of Massachusetts Hospitals for Consumptives states that it is the intention ultimately to conduct four sanatoria for the active treatment and arrest of early and favorable cases

of pulmonary tuberculosis. This ideal can be attained only when there are enough beds in municipal tuberculosis hospitals, so that the trustees no longer have to give so much consideration to the question of segregation of the open cases of tuberculosis, and the protection of the public as they do at present. With the exception of the Rutland State Sanatorium, it has been the custom to admit patients in all stages of the disease, but with the increased number of beds in use in local tuberculosis hospitals, the time has come when the Board feels that more discrimination should be used in the selection of patients for the State Sanatoria and that the institutions at North Reading, Lakeville, and Westfield should be sanatoria in fact as well as in name. The daily average number of patients at the North Reading State Sanatorium has been 198, that at Lakeville 256, at Westfield 254 and at Rutland 349. The waiting list for all four sanatoria is long,—about 400 names at the present time,—which is significant, not of the increase of tuberculosis, but owing to the establishment of local dispensaries and other activities, that more cases than heretofore are being diagnosed and are seeking sanatorium treatment.

GIFT TO WINCHESTER HOSPITAL.—The cornerstone of the new Winchester (Mass.) Hospital was laid with appropriate ceremony on May 18, and on this occasion announcement was made of a gift to the Hospital of \$50,000 from Mr. George Harrington, a resident of the town. The conditions of the gift are that the Hospital shall receive the interest on this sum for two years and that at the end of that time, if the present mortgage of \$15,000 has been paid, the entire sum of \$50,000 shall be transferred in absolute gift to the trustees. The total cost of the Hospital is over \$67,000. The building will contain two wards, each for eight patients, a number of private rooms, an operating room and an obstetric department.

EPIDEMIC OF TONSILLITIS IN WATERTOWN.—There has recently occurred in Watertown, Mass., another epidemic of a type with which the medical profession has become more familiar in recent years, of streptococcic tonsillitis, which in this instance appears to have been milk borne. There were in all over 40 cases with two fatalities. The infection was traced, on May 20, to a single milk route upon which all the cases had occurred. A cow supplying milk to this dealer was found to have a septic ulceration of the udder. The cow was slaughtered and the same streptococcus was recovered from this ulceration as from the tonsillar lesions of the human patients. The epidemic, which is now controlled, is to be investigated by Dr. David L. Edsall whose further definite report will determine the accuracy of the above unofficial statement.

BOSTON CITY HOSPITAL TRAINING SCHOOL.—The graduating exercises of the Training School for Nurses of the Boston City Hospital were held in the surgical out-patient building on Friday, May 26, at 4 o'clock. A reception was held in the Vose house from five to six of the same day.

WORCESTER CITY HOSPITAL.—The report of the Worcester City Hospital for the year ended November 30, 1915, has been recently published. It records a total number of 1,884 patients treated in the surgical wards, and 1,752 in the medical wards. The number of children admitted was 645. There were admitted to the maternity service 551 patients, and to the out-patient department 7000 new patients. The training school for nurses graduated 30 pupils, and 94 probationers were received during the year. The pathological department continues to be one of the important departments of the Hospital. Surgical specimens to the number of 548 and bacteriological cultures to the number of 891 have been examined for diagnosis. One thousand four hundred and forty Wassermann tests for syphilis have been performed and, with the beginning of 1916, by arrangement with the Board of Health, free Wassermann and Schwartz tests are offered to the physicians of Worcester.

REGISTRATION IN DENTISTRY.—At the continued March examination of the Massachusetts State Board of Registration in Dentistry, 25 more candidates were passed, in addition to those announced on the earlier list.

NEW HAMPSHIRE MEDICAL SOCIETY.—At the annual meeting of the New Hampshire Medical Society at Concord, N. H., on May 16, the following officers were chosen for the ensuing year: Dr. Emden Fritz of Manchester, president; Dr. Fred S. Towle, Portsmouth, vice president; Dr. Dennis E. Sullivan, Concord, secretary; Dr. D. M. Currier, Newport, treasurer.

THE CHILDREN'S HOSPITAL.—The Children's Hospital, in its recently published forty-seventh annual report, records the work of that institution in its first year of occupancy of the new hospital buildings. In statistics the growth of service is presented as follows: the patients admitted to the wards have increased 1,296, 74%; the operations have increased 690, 42%; the attendance of out-patients has increased 15,000, 55%; and the social service department has gained 99% in new cases and 32% in the total number of visits made.

The Convalescent Home at Wellesley Hills has completed its thirty-first year of establishment and is continuing to maintain itself as an important part of the Hospital. The number of patients treated was 530, with a daily average of 55, and these figures would be higher had there not been several cases of scarlet fever at

various times, necessitating periods of quarantine.

The managers have voted to establish a system of subscription beds, by which a subscriber of \$100 may for one year, subject to the rules and regulations of the Hospital, nominate one patient at a time to one of said beds.

The large increase in the demands made upon the Children's Hospital since moving into the new building is such that this year a deficit of about \$65,000 was faced.

This threatened deficit was more than met by the generosity of certain persons as the result of a special and earnest effort on the part of a sub-committee.

The normal annual receipts from the public in donations have been between \$10,000 and \$12,000. The problem is to increase this yearly amount to \$60,000, and the managers earnestly appeal to the generosity of the community to support an institution which does so much for so many children, and by its increasing use proves its necessity.

BOSTON STATE HOSPITAL.—The seventh annual report of the Boston State Hospital records the work of that institution and its department, the Psychopathic Hospital, for the year ended November 30, 1915. At the beginning of the year, 1,472 patients were under the care of this Board, of whom 1,374 were in the main hospital and 98 were at the psychopathic department. At the close of the year the number of persons for whom the hospital was responsible had increased to 1,609, of whom 1,498 were at the main hospital, 100 at the psychopathic department, and 11 were in the care of private families, the trustees having assumed during the year, at the request of the State Board of Insanity, the care of patients who had been placed with private families. The cases in the main hospital, never before in any hospital for the insane, numbered 1,008. Concerning this group of first admissions, the following facts are noted, in accordance with custom: Four hundred sixty-nine, or 46.5%, were foreign born, and 718, or 71%, were of foreign parentage on one or both sides. The average age on admission was 43.2 years. Seventeen per cent. were 60 years of age or over, and 15 patients were over 80 years old. The probable cause of the mental disease was recorded in 513 of these cases; the cause was unascertained in 495. Of ascertained causes the principal ones were: senility and arteriosclerosis, 139 cases; syphilis, 133 cases; alcohol, 124, in which it was the exciting cause, besides 35 in which this was a contributory or predisposing factor. At the psychopathic department the native-born (1099) were found to exceed in numbers the foreign-born (854); the birthplace of 48 was unknown. The average age on admission was 36.9. Of the discharges, 673 were discharged not recovered, 508 not insane, 96 recovered, 51 dead.

Obituary.

WILLIAM PALMER BOLLES, M.D.

THE following memorial to Dr. WILLIAM PALMER BOLLES was read at a meeting of the Dorchester Medical Club. He was a devoted member of the Club from the time of his election in 1873 until his death, which occurred on March 18, 1916.

Dr. Bolles graduated from the surgical side of the Boston City Hospital in May, 1871, and the following month received his degree from the Harvard Medical School. Soon after graduation he was appointed to the staff of the Boston City Hospital, and served most faithfully in several positions until his death.

His professional interests were chiefly surgical, yet after the custom of his time, he never entirely relinquished his general medical practice. Even after his retirement from active practice many of his devoted patients refused to give him up. He was a careful surgeon, always keen in diagnosis, and most thoughtful of the after-treatment and the ultimate good of his surgical procedure. His skill was due to an unusual capacity for taking pains, the extraordinary deftness of his hands, and the fertility and ingenuity of his brain. During his most active years he contributed numerous articles to medical literature; he invented a fracture box, a salt solution bottle for irrigations, and a portable sterilizer, which was very useful when operations were performed in private houses.

Dr. Bolles had a passion for acquiring knowledge, and read unceasingly in many subjects. He was a skilful botanist, and in the few weeks he spent in Santa Barbara, just before his death, classified more than forty plants. At the time of his retirement from the professorship of *materia medica* and botany at the Massachusetts College of Pharmacy, he gave his collection of over two thousand botanical specimens to the college.

He was an expert craftsman and made beautiful articles in silver, copper and wood, many of which he gave to his friends. He believed every one should have an avocation, and often cautioned his young friends about the danger of growing old without one.

But last and greatest was his unvarying kindness. He was a staunch and loyal friend, and thoroughly enjoyed having his friends about him. He was never too busy or hurried to give his helpful thought to others, and to assist them with their problems. A most delightful companion, whom one never left without feeling better for his instructive, entertaining, and often delicately humorous conversation. Dr. Bolles was a courtly gentleman, always thoughtful of the feelings of others and he believed the best of all men. His place in the Club will be taken by another, but he can never be supplanted in the hearts of his fellow members.

Miscellany.

REPORT ON TESTS FOR VISION AND HEARING IN BOSTON PUBLIC SCHOOLS.

1907 - 1916.

By WILLIAM H. DEVINE, M.D.,

Director of Medical Inspection, Boston Public Schools.

For the past ten years the pupils in public schools have been tested annually by teachers for defects of vision and hearing. A careful survey of table will show results obtained. From 1907 to 1916 there was a steady decrease in the percentage of defective vision, 1916 showing a slight increase (fraction of 1%).

Practically the same may be said of defective hearing. In 1910, 1913, and 1915 there was a slight increase over preceding years.

The difference between figures of early and later years is so striking that it furnishes ample proof of the benefit derived in school life from annual testing. The defects in vision and hearing show the importance of special classes for those who have serious defects.

"Two classes for defective vision of those who are not institutional cases have been established. These are provided with expert teachers and an equipment especially designed for treating children who have some vision, though extremely defective. They are assembled in one center in Roxbury. There are twenty-two of these children, most of whom come from distant parts of the city, car fare being provided by the schools. They are distributed into seven classes, though most of the work has to be done individually. The pupils, with one exception, have better than one-tenth normal vision. These children have the attention of a special physician. An experienced oculist has oversight of the work, and two teachers, who have been trained at the Perkins Institute, give the instructions, which include the ordinary curriculum of the course of study, and especially adapted manual work.

"The deaf have good instructional opportunities at the Horace Mann School, with a staff of fifteen teachers and 144 children below high school grade. Although the building is overcrowded, the character of the work is exceptionally fine, and the teachers are among the most efficient and devoted in the entire city."—From Report of Dr. Franklin B. Dyer, Superintendent Public Schools, 1915.

In line with this, I quote from an article written by Mary Bronson Hartt, on "Foresight for the Sightless," *Boston Transcript*, May 20, 1916:

"Twenty-three hundred—maybe twice as many—wretched youngsters stumbling along in Massachusetts schools, accounted stupid, lazy, or even feeble-minded, kept back among children half their size, a burden to their classes, a de-

spair to themselves, because, poor infants, they are more than half blind. It doesn't better the case to realize that in the enlightened decades just behind us a little army of semi-sighted children must have struggled to maturity, cheated of an education altogether, or else, if mentally keen and strong of heart, must have fought their way to education of a sort at fearful cost to health and eyesight. Such defrauded children have swelled the ranks of the delinquent or the economically helpless, or if they have achieved independence have done it too often at the sacrifice of what sight they had, bringing up eventually among the totally blind.

"Since 1900, investigations have been making in Europe which ought logically to have resulted decades ago in special training for little 'half blinds.' Yet the special classes in London, Birmingham, Mulhausen and Strassburg were still young when Boston opened her semi-sighted class in the Little Wooden Schoolhouse in Thorn-ton Street, Roxbury, three years ago this spring.

"It was Edward E. Allen, director of the Perkins Institute, who awakened Massachusetts. The growing proportion of half-sighted girls and boys applying for education at Perkins stirred him to appeal to the Commission for the Blind and the school authorities for relief,—not for Perkins, but for the youngsters themselves. It is, he contends, a serious mistake to give a child with partial sight the education planned for the blind, unless, indeed, his sight is going, and he must one day support himself without it.

"Mr. Allen felt that as these partial-sighted boys and girls can see to get about among normal people, it was most unwise to isolate them for their school days among the blind. The result of Mr. Allen's initiative was a joint effort of the school authorities, the Massachusetts Commission for the Blind and a group of Boston eye-specialists to establish a school where the most heavily handicapped of our semi-sighted children might be taken care of, and also the passing of a bill empowering the commission to investigate the vision of school children throughout the State."

When framing the law for the examination of vision and hearing by teachers contemplated, experts appointed by His Excellency, the Governor, stated that the teacher is qualified for testing vision and hearing. This opinion is confirmed by the results obtained in Boston schools. The teacher is in touch with the child, knows his capabilities and whims. She is not apt to mistake dullness of intellect, eccentricity or backwardness for a defect in vision or hearing. A course is given at the Boston Normal School on testing of vision and hearing.

After the completion of the testing of vision by the school teachers, the school nurses retest all the pupils reported defective. This retesting is done under the best possible conditions of light, and the number of cases found defective

is considerably less than the number found by the teachers. During the school year 1915-16, out of 10,922 children retested, the number found normal was 4,044.

In testing the hearing of children, one person should make the examination for the entire school in order to insure an even method. The one selected should have normal hearing, and preferably be known to the children, the announcement of the examination often tending to inspire fear. The examination should be conducted in a room not less than twenty-five or thirty feet long, and situated in as quiet a place as available. The floor should be marked off with parallel lines one foot apart, the child sitting in a revolving chair on the first space. The two ears should be tested separately. Experience demonstrates that the method of testing vision and hearing by teachers and retesting by nurses is an efficient method. The following is issued at the beginning of every school year for the guidance of teachers:

"The annual testing of sight and hearing, as required by Chapter 502, Acts of 1906, should be made as early as possible in the school year. This will give the school nurses the data necessary to enable them to 'follow up,' earlier in the school year, each child found defective in sight or in hearing. You are requested to furnish the data on this examination, on the enclosed blank, not later than November 1, 1915. Each child found defective in sight or in hearing *should be referred to the school nurse for special re-testing by her* before the parent or guardian is notified that an examination by a specialist seems desirable. Copies of 'Directions for Testing Sight and Hearing,' issued by the State Board of Education, with other necessary material, may be secured at the Supply Room, Public Latin School. Your attention is especially directed to the following instructions issued by the State Board of Education:

"1. Children wearing glasses will be tested *with the glasses*, and if found normal, will be so recorded. Such children should not be tested without glasses.

"2. No child is to be recorded as defective in vision unless the vision is 20/40 or less in either eye.

"Notification to Parents:

"1. The parent or guardian is to be notified whenever the vision in either eye is found to be 20/40 or less. No notice will be sent when the vision is 20/20 in both eyes, 20/20 in one eye and 20/30 in the other, or 20/30 in both eyes. This includes vision with glasses.

"2. The parent or guardian is to be notified also when the examination shows that the eyes or eyelids are habitually inflamed; when there is constant complaint of pain in the eyes or head after reading or writing, especially toward the end of school hours; when one or both eyes deviate from the normal position—squinting—;

SUMMARY OF HEARING AND VISION TESTING.

1907 to 1916.

	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	Total
No. of pupils tested in vision.....	83,000	82,255	82,924	84,058	81,747	83,075	77,462	80,508	91,226	92,552	890,877 (16888)
No. of pupils normal in vision.....	75,474	72,522	74,116	76,755	74,902	79,587	74,912	78,436	80,287	80,653	800,523
No. of pupils defective in vision.....	26,455	19,733	18,808	17,303	12,845	12,488	11,912	11,070	11,039	11,899	11,354
Per cent. of defective vision.....	31.50	23.97	22.70	20.58	15.45	15.03	14.37	12.36	12.08	12.86	12.86
No. of pupils tested in hearing.....	77,080	82,265	82,944	87,343	86,055	87,075	88,788	91,529	93,024	92,415	893,347 (16888)
No. of pupils normal in hearing.....	68,249	75,493	78,815	80,569	82,650	79,806*	85,504	90,100	90,186	89,884	890,884
No. of pupils defective in hearing.....	6,829	6,772	4,129	4,774	3,405	3,269	3,224	2,169	2,758	2,531	2,463
Per cent. of defective hearing.....	8.15	7.63	4.91	5.39	3.90	3.69	3.62	2.37	2.8	2.79	2.75
No. of pupils wearing glasses.....	.....	.....	8,735	6,841	6,285	7,672	5,950	6,027	5,941	5,941	5,941
No. of pupils normal in vision with glasses..	.....	.....	7,149	7,865	7,634	7,756	7,360	7,569	7,374	7,374	7,374
No. of pupils defective in vision with glasses..	.....	.....	3,315	3,306	2,711	2,807	2,590	2,458	2,455	2,455	2,455
No. of pupils defective in vision not wearing glasses.....	.....	.....	15,493	13,357	10,073	9,591	10,011	8,611	8,694	9,276	86,444
No. of pupils defective in both vision and hearing.....	.....	.....	1,895	.....	1,081	1,092	1,533	712	588	726	726
No. of pupils corrected in vision since last test.....	.....	.....	5,081	3,189	3,166	3,355	2,963	2,805	2,733	2,759	26,444
No. of pupils corrected in hearing since last test.....	.....	.....	1,213	875	681	614	565	487	438	351	5,160

* First two grades not tested.
The chart for the years previous to 1916 was prepared by Thomas F. Harrington, M.D., formerly Director of School Hygiene.

when the book is habitually held at less than one foot from the eyes; when there is constant scowling and evident effort in using the eyes.

"3. The parent or guardian should be notified of any evident degree of deafness; also of any discharge from the ear."

Correspondence.

IS THE GENERAL PRACTITIONER INCOMPETENT TO TREAT GONORRHEA?

CAMBRIDGE, MASS., May 26, 1916.

Mr. Editor: Another enemy to the general practitioner has taken the field. Just as the echoes of "Better Doctoring for Less Money" were beginning to die out, we are told by Dr. J. Dellinger Barney in "The Management of Gonorrhea," published in the JOURNAL of May 25, that: ".....the average general surgeon or practitioner is incompetent to undertake the treatment, and especially to determine the cure of a gonococcus infection of the urethra. By doing so he assumes a burden of responsibility which he has no right to bear....."

The general practitioner does understand fully the serious nature of this loathsome disease and we vigorously protest the assertion that we are "by no means yet conscious of the difficulties of its management or of the responsibility involved in pronouncing it cured."

Gonorrhea patients form the most disreputable part of a man's practice, and no matter how well they are treated, they have no sense of gratitude. As a class, they do not pay their bills; they will not take complete treatment, even though its necessity is carefully explained to them, and the small expenses of microscopic examinations of the prostatic secretions, or a gonococcus fixation test, will be rebelled at and refused.

The solution of the problem as advocated by Dr. Barney is unique. We are advised that "the Public Health authorities should keep on file a list of such physicians throughout the state who, by their training and experience, and hospital and teaching connections, are competent to handle venereal disease." If the doctor is sincere in this suggestion, we would say that such a plan would be impossible because it is unconstitutional, for it would be a type of class legislation. We already have a State Board of Registration in Medicine that passes on a man's fitness to practise medicine in this state. He is not restricted to certain kinds of work nor is he classified according to his ability, but he is allowed to practise medicine and surgery in their entirety.

"We are holier than thou," appears to be the motto of a certain group of men in Boston today. There seems to be an intrigue among some of these men to crush down the rest of the profession. Careful reading of Dr. Barney's article will make one wonder if undue emphasis has not been placed on the "teaching and hospital connections" as a qualification for a place on the remarkable list of physicians that he suggests the state might form. How fine for the chosen ones to declare that they are the certified state physicians for the care of gonorrhea,—and how their less fortunate brothers, who could not convince the local politician that they were competent and equipped to treat such cases, would wince at the injustice!

The restriction of the field of medicine to one petty specialty, with its resulting narrow and biased vision, is one of the faults and dangers of present-day medicine. The specialists become ultra-radical and almost fanatics in the consideration of their problems. The general practitioners are treating and curing thousands of cases. The worst of these cases drift into

the metropolitan hospitals and are treated by the specialists, who there form the idea that all cases in general practice are similar to these, and that the general practitioner is therefore incompetent to treat them.

The depreciation and maligning of the general practitioner must stop. We are willing to be instructed by proper articles in the medical journals on new methods of treatment but,—we refuse to be insulted and held up to false ridicule.

Very truly yours,
HERBERT J. CROBIN, M.D.

AN EXPLANATION.

BOSTON, May 25, 1916.

Mr. Editor: It has been called to my attention that my paper on Acid Autointoxication in Infancy and Childhood, which appeared in the *BOSTON MEDICAL AND SURGICAL JOURNAL*, April 20, 1916, has been criticized on the ground that many of the statements in it were copied from other articles. This criticism is unquestionably true, much of the data on the chemistry of the subject having been taken from the abstract of the meeting of the New York Academy of Medicine on Acidosis, which appeared in the *Journal of the American Medical Association* of January 8, 1916. Most of the rest of the data were taken from von Noorden's *Acid Autointoxication*, published by E. B. Treat & Co.

It did not seem necessary to me specifically to give credit for what was taken from these sources, because, in my opinion, they were merely good statements of what was common knowledge. If anyone feels offended that credit was not specifically given, I hereby most humbly beg his pardon. I may say, in passing, that it never occurred to me that anyone would look upon the preliminary portion of my paper as anything more than a statement of the present opinion on this subject, or that anyone would for a moment suppose that I personally, being solely a clinician, should have any first-hand knowledge of such an obscure subject as the chemistry of acidosis.

Yours very truly,
JOHN LOVETT MORSE, M.D.

THE USE OF NITROUS-OXIDE AND OXYGEN IN THE TREATMENT OF FUNCTIONAL NERVOUS DISEASES.

WELLESLEY HILLS, MASS., May 25, 1916.

Mr. Editor: In using nitrous-oxide and oxygen for several years in dental operations the author has many times been impressed with the marked improvement manifested by many patients (as the result of suggestions in a certain stage of analgesia with the above anesthetic) who had been sufferers from a variety of ailments of nervous or mental origin. Now after observing a considerable number of cases, it would seem safe to predict that this agent will be of great value in psycho-therapy and psycho-analysis.

The particular stage of analgesia necessary for best results in the great majority of cases, has so much to commend it, with practically no counter-indications, that it would seem much preferable to a state of hypnosis, which has so often been used in treating these diseases, and the ease with which the majority of patients can assist in exploring the so-called "sub-conscious" mind, and the quick response to intelligent suggestion, are points which should encourage its use for the diseases indicated, but only by those with a most thorough knowledge of the administration of the anesthetic.

Two cases (all that the author has had opportunity to observe of this type) of seemingly hopeless alcoholism, where the mental condition of patients seemed to indicate unsound mind, have responded splendidly

to the treatment, as well as a number of other functional nervous diseases, and it would seem that there is a very large field for its application, including its employment in the treatment of abnormal mental, nervous and even criminal tendencies. It would be desirable that its use, and the results obtainable, be observed by those who come in contact continually with these ailments.

Very truly yours,
SHELLEY B. OSBORNE, D.M.D.

NOTICES.

NAVY MEDICAL CORPS EXAMINATIONS.—Among the various items of increase in national preparedness which it is hoped will be afforded by the present session of Congress, is that authorizing an appropriate increase in the personnel of the military services. One item of interest to the medical profession of the country is that calling for an increase in the Medical Corps of the Navy from its present strength of 347 to approximately 500. The openings at present afforded young graduates in medicine for entering the Medical Corps of the Navy will be materially increased in prospects and rewards, therefore, if such an increase is provided.

An examination will be held on June 19, next, for appointment in the Medical Corps to vacancies already existing. A candidate for appointment must be between 21 and 30 years of age, a graduate of a reputable school of medicine, and must apply for permission to appear before an examining board. These boards are convened at various places over the country, and assignments to such boards are arranged to suit the convenience of the candidate.

Duty in the Medical Corps of the Navy is one that affords plenty of rewards to the ambitious worker, as well as attractions of a varied nature in personal and professional work. Pay begins at the rate of \$2,000 per annum, with ample allowances, and promotion and increase in pay and allowances follow every few years.

It is hoped that the young men of the United States will take advantage of this attitude of the nation, now on the threshold of expansion in national ideals of preparedness, and find in the service of their country an outlet for their future life work.

For detailed information as regards the coming examination, on June 19, 1916, applicants should address the Surgeon General, U. S. Navy, Navy Department, Washington, D. C.

UNITED STATES CIVIL SERVICE EXAMINATION.—The United States Civil Service Commission announces an open competitive examination for clinical director, for men only. From the register of eligibles resulting from this examination, certification will be made to fill a vacancy in this position in the Government Hospital for the Insane, Washington, D. C., at a salary of \$2,000 per annum, with maintenance in the hospital, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

Applicants must be graduates of a medical school of recognized standing, and must have been in actual charge of a medical service in an institution for the care of the insane for at least five years, during the entire period of which time they must have received special training in psychiatry. They must have contributed to medical literature (a) on the general subject of insanity in some of its phases, or (b) by report of cases coming under their observation.

The appointee, in his capacity as clinical director, will have general administrative supervision of the medical work of the hospital, together with supervision and care of the hydrotherapeutic department.

operating room, and training school for nurses; all transfers of patients from one service to another will be made through him; he will have charge of the clinical records and will see that they are properly kept, and be in a position to offer suggestions that recent medical literature may contain along the lines of clinical psychiatry.

Statements as to education, training, and experience, are accepted subject to verification. Applicants must not have reached their thirty-fifth birthday on the date of the examination. This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply for Form 1312, stating the title of the examination desired, to the United States Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Post Office, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Cal., Custom House, New York; New Orleans, La., Honolulu, Hawaii; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed, excluding the medical and county officer's certificates, and must be filed with the commission at Washington prior to the hour of closing business on June 27, 1916.

ARMY MEDICAL CORPS EXAMINATIONS.—The Surgeon General of the Army announces that preliminary examinations for the appointment of First Lieutenants in the Army Medical Corps will be held on July 17, 1916, and August 14, 1916, at points to be hereafter designated.

Full information concerning these examinations can be procured upon application to the Surgeon General, U. S. Army, Washington, D. C. The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between twenty-two and thirty years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training as an interne, after graduation. The examinations will be held simultaneously throughout the country at points where boards can be convened. Due consideration will be given to localities from which applications are received in order to lessen the traveling expenses of applicants as much as possible.

In order to perfect all necessary arrangements for the examination, applications must be completed and in possession of the Adjutant General, at least three weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There will be more than 100 vacancies to be filled after July 1, when the bill for the reorganization of the army becomes a law.

THE PSYCHOPATHIC HOSPITAL. 74 Fenwood Road, Boston.—Fourth annual conference on the Medical and Social Work of the Psychopathic Hospital, Saturday, June 10, 1916, 4 to 6 p.m., under the auspices of the Trustees of the Boston State Hospital

PROGRAM.

PRESIDENT HENRY LEFAYOUC, Chairman of the Board of Trustees, will preside.

I. "The Classes of Service Rendered by the Psychopathic Hospital, Medical, Public, Social, Individual." Dr. E. E. Southard, Director, Psychopathic Hospital.

II. "Social Service from the Medical and Psychiatric Points of View." Dr. H. M. Adler, Chief of Staff, Psychopathic Hospital.

III. "New Administrative Problems, Intramural and Extramural, of the Psychopathic Type of Pa-

tient." Dr. E. H. Cohoon, Administrator, Psychopathic Hospital.

Brief recess.

IV. "The Situation in the Problem of Brain Syphilis." Dr. H. C. Solomon, Special Investigator, State Board of Insanity, Massachusetts.

V. "Advances in Psychological Examination, Especially of Psychopathic Patients," R. M. Yerkes, Ph.D., Psychologist, Psychopathic Hospital.

VI. "Mental Hygiene and Preventive Medicine." Dr. T. W. Salmon, Medical Director, National Committee for Mental Hygiene.

Before the meeting, small groups of visitors may be taken over characteristic portions of the hospital.

Displays of the scientific work of the hospital will be found in the out-patient department, in the library, in the laboratories, and in the assembly room, including:

1. Diagnostic wall-charts.
2. Social service statistics.
3. Psychological test apparatus.
4. Clinicopathological work.
5. Researches.

The work of the pathological service and the bureau of standards of the State Board of Insanity may also be looked over by interested visitors in the special rooms assigned thereto.

SOCIETY NOTICES.

HARVARD MEDICAL ALUMNI ASSOCIATION.—The annual meeting of the Harvard Medical Alumni Association will be held in Harvard 5 at 12.30 o'clock on Commencement Day, Thursday, June 22. At this meeting a change in the Constitution is to be voted on, the purpose of which is to do away with the initiation fee and the first year's dues in order to encourage new members. For this purpose it is proposed to change Section 3 to read as follows:

"Every member shall pay after his first year of membership an annual due of one dollar; but any member may become a life member by the payment of twenty dollars in one payment, after which he shall be relieved from the payment of all dues."

A. B. EMMONS, 2d, M.D., Secretary.

SECOND ANNUAL MEETING OF THE INTERSTATE ASSOCIATION OF ANESTHETISTS.—The second annual meeting of the Interstate Association of Anesthetists will be held at the Hotel Seelbach (Red Room), Louisville, Ky., July 25, 26 and 27, in conjunction with the National Dental Association.

The following program has been arranged for the scientific sessions:

Address of Welcome and Presentation of Gavel, L. S. McMurtry, Louisville, Ky.; Chairman's Address. Progress in the Technical Administration of Anesthesia and Analgesia, William Hamilton Long, Louisville, Ky.; Anesthesia, the Anesthetist and the Operative Procedure from the Surgeon's Viewpoint, F. G. DuBoise, Selma, Ala.; Metabolic and Organic Changes Under Anesthesia, Everts Graham, Mason City, Ia.; Preparatory Anesthetic and Post-operative Regime for Hazardous Risks in Genito-Urinary Surgery, Moses Salzer, Cincinnati, O.; A New Method for the Production of General Analgesia and Anesthesia, D. E. Jackson, St. Louis, Mo.; Nitrous Oxid-Oxygen in Obstetrics, Carl H. Davis, Chicago, Ill.; Ether-Oil Colonic Anesthesia in Head and Neck Operations, Joseph E. Lumbard, New York City; Some Direct and Indirect Dangers of Nitrous Oxid-Oxygen and Its Ultimate Position in Major Surgery, John N. Heim, Louisville, Ky.; Oral Hygiene in Relation to Anesthesia and Analgesia, Bion R. East, Detroit, Mich.; Control of Circulatory Disturbances Under Anesthesia and Analgesia, Hewett of Chicago, and Chloroform Anal-

gesia, William Harper Deford, Des Moines, Ia.; Crawford W. Long and Ether, E. M. Magruder, Charlottesville, Va.; The Romance of Evans and Nitrous Oxid, Edward C. Kirk, Philadelphia, Pa.; Hickman, a Forgotten Pioneer, C. J. S. Thompson, London, Eng.

An innovation will be a special Section of Dental Anesthetics, for which the Association will adjourn to MacCauley's Opera House. The special program for this joint session with the National Dental Association will be as follows:

Introductory, William Hamilton Long; Chairman's Address: Anesthesia and Analgesia in the Curriculum, the Clinic and Private Practice, Hugh W. MacMillan, Cincinnati, O.; Oral Operations Under Nitrous Oxid-Oxygen Anesthesia in the Forward-Inclined, Sitting Posture, Ira O. Denman, Toledo, O.; Vapor Anesthesia for Oral Surgery, Truman Brophy, Chicago, O.; Intra-Oral Methods of Local Anesthesia, Rich. H. Riethmuller, Philadelphia, Pa.; Extra-Oral Methods of Local Anesthesia, Kurt H. Thoma, Boston, Mass.; Handling Emergencies Under Anesthesia and Analgesia, N. T. Yager, Louisville, Ky.

The Association Dinner will be served at the Hotel Seelbach and a number of prominent after-dinner speakers will enliven the occasion with their wit and humor. Special entertainment will be provided for all lady guests attending the Louisville meeting.

For further information and dinner reservations address

F. H. McMECHAN, M.D., *Sec-Treas.*,
Avon Lake, Ohio.

AMERICAN MEDICAL EDITORS' ASSOCIATION.—The annual meeting of this Association will be held at the McAlpine Hotel, New York City, on October 25 and 26.

A most interesting program is in course of preparation and the Local Committee, composed of the following members, is an assurance of a successful convention.

Dr. Thomas L. Stedman, Editor, *Medical Record*, chairman.

Dr. R. H. Sayre, *New York Medical Journal*.

Dr. Brooks H. Wells, Editor, *American Journal of Obstetrics*.

Dr. Frank C. Lewis, *International Journal of Surgery*.

Dr. Ira S. Wile, *American Medicine*.

The officers of the Association for 1915 and 1916 are as follows:

Dr. Edward C. Register, President.
(*Charlotte Medical Journal*, Charlotte, N. C.)

Dr. W. A. Jones, First Vice-President.
(*Journal Lancet*, Minneapolis, Minn.)

Dr. G. M. Piersol, Second Vice-President.
(*American Journal of the Medical Sciences*, Philadelphia, Pa.)

Dr. J. MacDonald, Jr., Secretary and Treasurer.
(*American Journal of Surgery*, New York.)

EXECUTIVE COMMITTEE.

Dr. C. F. Taylor, *Medical World*, Philadelphia, Pa.
Dr. John C. MacEvitt, *New York State Journal of Medicine*, New York.

Dr. A. S. Burdick, *American Journal of Clinical Medicine*, Chicago, Ill.

Dr. Joseph MacDonald, Jr., *American Journal of Surgery*, New York.

The meeting on October 25 and 26 will be devoted exclusively to problems of a strictly journalistic nature, which will be of importance and interest to every editor and publisher of a medical journal. Among the papers to be presented are the following: "Editorial Control." "The Editor's Prerogative in Editing Original Articles." "Book Reviews in Medical Journal." "Problems of the Subscription Department."

"The Relationship Between Medical Journals of the Day." "The Uplift in Medical Journalism." "The Influence of the Medical Press and Profession in Public Affairs." "The Rights of an Author in the Disposition of his Contribution," etc.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.—A Summer Outing of the Essex North District Medical Society will be held on the beautiful grounds of the Merrimack Valley Country Club, Methuen (Tel. Lawrence 8442), Wednesday, June 14, 1916, at 2 P.M. sharp. The Club House is situated upon the Lawrence-Haverhill line of the Massachusetts Northeastern Street Railway Company and also upon an excellent highway from Haverhill via River Road. An efficient committee has arranged a series of sports beginning with a ball game at 2, followed by 100-yard dash, fat men's race (180 pounds and over), 3-legged race, tug-of-war, etc., for which there will be suitable prizes. Excellent facilities for tennis, bowling and golf will be at the disposal of Fellows. An appetizing dinner will be served by the Club chef at 5 P.M. sharp, at \$1.25 per plate. Parking space gratis. Medical friends may be invited. Come and enjoy the fun and participate p. r. u.

F. B. PIERCE, M.D., J. FORREST BUENHAM, M.D.,
President. *Secretary,*
99 Bradford St.,
Lawrence, Mass.

APPOINTMENTS.

HARVARD UNIVERSITY.—Dr. Ernest E. Tyzzer has been appointed George Fabry Professor of Comparative Pathology, and Dr. Charles J. White is appointed Edward Wiggleworth Professor of Dermatology.

UNIVERSITY OF Breslau.—Dr. Ernst Gaupp of the University of Königsberg has been appointed professor of anatomy at the University of Breslau.

UNIVERSITY OF OHIO.—Dr. Clyde Brooks of the University of Pittsburgh, has been appointed professor of physiology, pharmacology and physiologic chemistry at the medical school of the University of Ohio.

UNIVERSITY OF OREGON.—Dr. William F. Allen, formerly instructor in anatomy at the University of Minnesota, has been appointed professor of anatomy in the medical department of the University of Oregon.

UNIVERSITY OF VIRGINIA.—Dr. Alfred L. Gray has been appointed professor of roentgenology, and Dr. Charles H. Lewis, professor of physiology.

RESIGNATIONS.

ST. ELIZABETH'S HOSPITAL.—It is announced that the following members of the staff of St. Elizabeth's Hospital, Brighton, have recently submitted their resignations to take effect on May 1, 1916: Dr. John W. Lane, Dr. Michael J. Cronin, Dr. Thomas F. Green, Dr. Andrew F. Downing and Dr. Herbert L. Johnson.

RECENT DEATHS.

DR. JAMES F. COSTELLO, who died on May 24, at Wollaston, Mass., was born in Quincy, Mass., in 1890. He received the degree of A.B. from Tufts in 1911, and that of M.D., in 1913. After serving as house officer in St. Vincent's Hospital, Worcester, for a year, he settled, in 1914, in the practice of his profession in Boston.

DR. S. M. BRICKNER, who died at Saranac Lake, on May 5, was born in 1863. He was a physician at Sloan Maternity and Mt. Sinai Hospitals, New York, and was known as a gynecologist and anatomist.

The Boston Medical and Surgical Journal

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Original Articles.

RESPIRATORY EXCHANGE, WITH A DESCRIPTION OF A RESPIRATION APPARATUS FOR CLINICAL USE.*

By FRANCIS C. BENEDICT, BOSTON,

AND

EDNA H. TOMPKINS, BOSTON.

PART I.

RESPIRATORY EXCHANGE, WITH SPECIAL REFERENCE TO ITS SIGNIFICANCE AND PATHOLOGY.

COMPARATIVELY little attention has been given by American clinicians to the significance of the respiratory exchange in pathological cases, but a study of this factor may show results of considerable value in the treatment of disease. For example, the respiratory exchange may be used to interpret a gain or loss in body-weight. While a change in body-weight is one of the most commonly used indices, the idea that the material gained or lost varies in character is relatively new. In fact, many clinicians are perhaps not aware that a loss in weight (especially an initial loss in weight) may be largely due to a loss of water from the body, even with patients not oedematous. Furthermore, they may have no knowledge as to whether the loss consists of fat, muscle, or carbohydrate. A total loss in weight may be an indication of a wasting disease or,

as in the case of obesity, an actual advantage. A loss in weight due to the loss of a specific material, may, however, vary in its interpretation according to the character of the material; thus, a loss of muscle and particularly a loss of carbohydrate would have a far greater significance than a loss of fat. A definite knowledge of the character of the loss in weight may be obtained by a study of the respiratory exchange.

In pathological cases it is distinctly of importance to know whether or not the demand for nutriment, as indicated by the total amounts of material consumed in the body, is met by the supply. If the loss or gain in body-weight is the only index depended upon by the clinician, a deficiency or excess of nutriment is shown only after an observation of several days or even weeks and valuable time is thus lost; furthermore, it is quite possible that losses or gains of organized body tissue, such as fat or muscle, may be completely masked by a change in the very large amount of water in the body. On the other hand, observations of the respiratory exchange will show very quickly the demand for energy under the conditions of observation, enabling the clinician to adjust without delay the supply to the demand.

Practically the only work that has been published from American clinics upon the respiratory exchange in pathological cases has been carried out in three laboratories, that of the Russell Sage Institute of Pathology in New York, that recently published by Means from the Massachusetts General Hospital, and that which was begun in 1909 and is being continued at the present time by the Nutrition Laboratory

* From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.

of the Carnegie Institution of Washington in Boston. It was soon recognized in the observations carried on by the Nutrition Laboratory that the majority of the earlier methods of studying the respiratory exchange were, for one reason or another, precluded from general acceptance in clinics and an attempt was made to broaden the field of study and increase the potentialities by devising, constructing, and testing a relatively simple apparatus called the "universal respiration apparatus." With this apparatus it is possible to measure the carbon-dioxide output and the oxygen intake with almost as high a degree of accuracy as with the costly calorimetric respiration chambers. While the apparatus has been used in a considerable number of studies with pathological cases, it was soon found that the method of connection with the subject by means of nosepieces or a mouth-piece was objectionable to many patients and we now have reason to believe that it often interfered with normal respiration. The construction of an apparatus which should be specially adapted for clinical use was, therefore, made a subject of further study. Before giving the results of this study, however, it seems desirable to define exactly what is meant by the terms "respiratory exchange" and "respiratory quotient," to consider their relation to the heat production and to outline the fundamental principles underlying a study of the respiratory exchange and the essentials for an apparatus designed for such use in pathological cases.

RESPIRATORY EXCHANGE.

The elementary physiological fact that considerable carbon dioxide is produced in the body is easily demonstrated by the familiar experiment of breathing into a test tube filled with lime water. That oxygen is being continually utilized by the body is less easily demonstrated and we must rely upon the extensive findings of chemical and physiological laboratories for the conclusive evidence that in all living processes not only is carbon dioxide produced, but oxygen is consumed. A quantitative knowledge of the

amounts of carbon dioxide excreted and oxygen consumed by human subjects has important theoretical as well as practical uses; this may best be shown by a consideration of the fundamental processes of metabolism.

From the chemical composition of the various important nutrients, such as sugars and fats, a computation may be made of the amount of oxygen required to oxidize completely one gram of the substance as well as of the amount of carbon dioxide produced in such oxidation. These calculations may be verified by burning a known weight of a pure nutrient, such as milk sugar or pure fat, in a calorimetric bomb containing oxygen under high pressure to assure complete combustion. Simultaneously the heat liberated in such combustion may be directly measured. As a result of a series of such calculations and actual combustions, definite data regarding the production of carbon dioxide, the oxygen required for complete combustion, and the amount of heat liberated for several of the three most important classes of nutrients have been collected in Table 1. As will be shown later, the ratios between the volumes of carbon dioxide produced and the oxygen consumed, and the heat production per gram or per liter of carbon dioxide produced or oxygen consumed are of special significance.

In the calorimetric bomb the end-products of combustion of sugar and fats are carbon dioxide and water. Precisely the same process takes place when the sugars and fats are burned in the animal body for, under ordinary conditions, they are converted to the same end-products, *i. e.*, carbon dioxide and water. The carbon dioxide is excreted from the body in gaseous form. The water produced by the oxidation of organic material may be excreted through the kidneys, may pass through the lungs and skin, or be added to the residual water always present in the body. All of the carbon burned in the body is, therefore, converted to carbon dioxide, but all of the oxygen absorbed is not converted into carbon dioxide but may be in part converted into water.

TABLE I.—RESPIRATORY QUOTIENTS FOR PROTEIN, FATS, AND CARBOHYDRATES.

Material ¹	Oxygen Required to Oxidize 1 Gram.		Produced in the Oxidation of 1 Gram.			Respiratory Quotient. CO ₂ c.c. O ₂ c.c.	Heat.			
	Weight.	Volume.	Carbon Dioxide.		Heat.		Per Gram of Oxygen.	Per Liter of Oxygen.	Per Gram of Carbon Dioxide.	Per Liter of Carbon Dioxide.
			Weight.	Volume.						
	Grams.	Cc.	Grams.	Cc.	Cal.		Cal.	Cal.	Cal.	Cal.
Starch	1.185	829.3	1.629	829.3	4.20	1.000	3.54	5.06	2.58	5.06
Cane sugar.....	1.122	785.5	1.543	785.5	3.96	1.000	3.53	5.04	2.57	5.04
Milk sugar ²	1.066	746.2	1.466	746.2	3.75	1.000	3.52	5.03	2.56	5.03
Animal fat.....	2.876	2013.2	2.811	1431.1	9.50	0.711	3.30	4.72	3.38	6.64
Human fat.....	2.844	1960.8	2.790	1420.4	9.54	0.713	3.35	4.79	3.42	6.72
Protein ²	1.367	956.9	1.520	773.8	4.40 ³	0.809	3.22	4.60	2.89	5.69

¹ These values apply likewise to dextrose and levulose.

² While this computation is based upon meat protein, the values will be essentially the same for all proteins. These values represent quantities found when burning protein not in a calorimetric bomb, but in the animal body.

³ The heat of combustion of protein averages 5.65 calories per gram; deducting the unoxidized material in the urine, the heat per gram would be 4.40 calories. For discussion of this point, see Atwater and Bryant, Storrs (Connecticut) Agr. Expt. Sta. Rept., 1899, p. 73. Since this value has to do with protein actually burned, it is not to be confused with the value 4.1, commonly used to calculate the calories from ingested protein of which a portion is assumed to be excreted undigested in the feces.

The relationship between the oxygen consumed and the carbon dioxide produced has been designated as the *respiratory quotient*. This relationship has a great physiological value and plays an important rôle in indicating the character of the material burned in the body. The theoretical respiratory quotient for the combustion of pure substances of definite chemical composition may be easily computed. Thus the simplest carbohydrate, glucose or dextrose, with a chemical formula of $C_6H_{12}O_6$, contains in its molecule sufficient hydrogen and oxygen to form water, and theoretically, at least, only enough oxygen is required from the air in the respiratory tract to burn the carbon in the substance. The simplest chemical reaction is therefore:



which shows that for every 6 molecules of oxygen absorbed, there are produced 6 molecules of carbon dioxide. Inasmuch as equal volumes of all gases contain the same number of molecules, when a pure carbohydrate such as glucose is burned, 1 liter of carbon dioxide is produced for every liter of oxygen consumed, and the volume ratio, *i.e.* $\frac{\text{Volume } CO_2}{\text{Volume } O_2}$ equals

1.00. The volume ratio or *respiratory quotient* not only of glucose, but of all other carbohydrates, including starch, cane and milk sugar, levulose and dextrose, is likewise 1.00. This is true, regardless of whether the combustion is carried on in the calorimetric bomb, or in the animal body. Therefore, if a measurement is made of the total oxygen consumption and the total carbon-dioxide production of a living animal, and the volumes of the carbon dioxide produced and the oxygen consumed are found to be equal, we say that the respiratory quotient of the animal at that time is 1.00.

A similar computation may be made for fat. Using the chemical composition of pure fat, we find that 1 gram of human fat requires 2.844 grams of oxygen (1,990.8 c.c.) for its combustion, and that as a result of the combustion 2.790 grams or 1,420.4 c.c. of carbon dioxide are produced. Under these conditions the respiratory quotient would be:

$$\frac{\text{Volume } CO_2}{\text{Volume } O_2} = \frac{1420.4}{1990.8} = 0.713$$

The calculation of the theoretical respiratory quotient of protein is less simple, owing to the fact that protein is only incompletely oxidized, a portion of the protein molecule being excreted unburned in the form of uric acid, urea, and other allied compounds in the urine. By the majority of writers the respiratory quotient of protein is considered as equal to 0.81.

A reference to Table 1 will show that carbohydrates have a respiratory quotient of 1.00, fat of approximately 0.71, and protein of 0.81. From these factors, therefore, it can be seen that the respiratory quotient of a living animal

may show wide variations, which will depend upon the class of nutrients burned in the body; it is accordingly easy to determine the character of the catabolism from the value of the respiratory quotient. Thus, if the metabolism is determined during complete starvation, *i.e.* when the subject is subsisting upon body fat and protein and the tissue burned is chiefly fat, the respiratory quotient would tend to fall, gradually approaching 0.71, the characteristic quotient for the combustion of fat. On the other hand, if a diet consisting largely of carbohydrates is taken, the respiratory quotient would tend to approach 1.00, the quotient characteristic of carbohydrate combustion.

As has been said, the calculation of the respiratory quotient for protein is theoretically very complex, but fortunately the rôle played by protein metabolism in the total metabolism is relatively small and remarkably constant, Magnus-Levy computing that the disintegration of protein is not far from 15% of the total catabolism. He further calculates that if the remaining 85% of the total metabolism is of carbohydrate alone, then the respiratory quotient, as a result of the existing combination of combustible materials, would be 0.971 instead of that of pure carbohydrate (1.00). On the other hand, if the remaining 85% of the catabolism is solely of fat, the respiratory quotient would be 0.722, instead of that of pure fat (0.71). If, therefore, the respiratory quotient lies between 0.71 and 1.00, and the nitrogenous excretion of the urine is known, an estimation can be made of the part played by protein, carbohydrate, and fat in the catabolism in the body.

Under ordinary conditions the respiratory quotient would lie between these two points. Values above or below them might reasonably be considered as due to faulty technique, or to a distinctly abnormal catabolism. If above 1.00, they might also be due to the formation of fat from carbohydrate, in which process carbon dioxide would be split off unaccompanied by the absorption of oxygen, and if below 0.71, to the possible formation of carbohydrate from fat, with a consequent absorption of oxygen unaccompanied by the production of carbon dioxide. It is thus clear that when the respiratory quotient is carefully determined considerable light may be thrown upon the character of the material burned in the body.

RESPIRATORY EXCHANGE AND HEAT PRODUCTION.

When sugar or fat is burned in the calorimetric bomb, the consumption of oxygen and the formation of carbon dioxide are accompanied by the liberation of a definite amount of heat. The heat liberated per gram by the principal classes of nutrients is included in Table 1, together with the heat production per gram and per liter of oxygen consumed and of carbon dioxide produced. The ratios between the heat production and the oxygen consumption or the

carbon-dioxide production are termed the *calorific equivalents* of oxygen and carbon dioxide respectively. These ratios are of equal, if not indeed greater, importance than the respiratory quotients for, by determining carefully the oxygen consumption and the carbon-dioxide production of a living organism, the energy production may also be computed with reasonable accuracy by means of the calorific equivalents of oxygen and carbon dioxide. It will be seen, therefore, that a study of the respiratory exchange gives us information not only regarding the character of the material burned, but definite information as to the total energy exchange of the living organism.

With the calorific equivalents as with the volume ratios between the oxygen consumption and the carbon-dioxide production, we find that considerable differences exist according to whether fat or carbohydrate is burned. Thus for each gram of carbon dioxide formed in the combustion of carbohydrate, 2.57 calories are liberated, and for every liter of carbon dioxide produced 5.04 calories. When fats are burned, the amount of heat per gram of carbon dioxide increases on an average to 3.40 calories and per liter to 6.68 calories. To apply intelligently a factor representing the heat production per gram of carbon dioxide, therefore, it is essential to know whether the energy is derived from the combustion of carbohydrate or of fat or, if from both, in what proportion. This fact may explain the difficulties incidental to the estimation of the total metabolism in the earlier development of respiration apparatus.

The measurement of the carbon dioxide produced by a living organism presents relatively few technical difficulties, and was early accomplished by Pettenkofer and Voit in their classical research. At that time the results obtained from the measurement of the carbon dioxide alone were considered of sufficient value from which to formulate broad physiological laws and, by using the average value for the calorific equivalent of carbon dioxide, experimenters computed the total energy transformations with a reasonable degree of accuracy. While with normal individuals it might be assumed without too great a violation of facts that there would be equal quantities of carbohydrate and fat involved in the metabolism and an average calorific value for carbon dioxide produced, this could not be assumed in pathological cases.

On the other hand, an examination of the calorific equivalents of oxygen shows that these values are much more nearly uniform, and that the amount of heat produced per gram of oxygen absorbed is much the same, irrespective of the material burned. Thus each liter of oxygen involved in the oxidation of carbohydrate corresponds to the liberation of 5.04 calories, while if pure fat alone is oxidized, each liter of oxygen is accompanied by the liberation of 4.75 calories. Inasmuch as the calorific equivalent

of carbon dioxide varies approximately 25%, according to whether carbohydrate or fat is burned in the body, while that of oxygen when fat is burned is but 6% lower than when carbohydrate is burned, it will be seen that the direct determination of the oxygen consumption gives the better measurement of the energy output of the body. Accordingly, the values for the oxygen consumption alone supply an index of heat production which is very nearly that which would be obtained by an actual measurement of the heat given off by a patient.

A complete study of the respiratory exchange would, therefore, consist of an accurate measurement of the carbon dioxide produced and the oxygen consumed. From these data we may compute: (1) the respiratory quotient and the character of the material burned in the body, and (2) the total heat production of the body and the fuel needs of the body, or, in the absence of food, the drafts upon the body substance.

RESPIRATORY EXCHANGE IN PATHOLOGICAL CASES.

In pathological cases not only is a knowledge of the total metabolism of great importance, but from the respiratory quotient and its interpretation much important information is derived regarding the character of the catabolism which may prove of even greater value than the data regarding the total metabolism. Thus far in perhaps no disease in which the respiratory exchange has been studied has the significance of the respiratory quotient played the rôle that it does in diabetes, in which the amount of carbohydrate burned is a very important factor. It will be remembered that it has already been shown that the combustion of carbohydrate tends to increase the respiratory quotient towards 1.00. With diabetes the combustion of carbohydrates is admittedly at a low point; hence respiratory quotients approximating 0.71 (or 0.72, that of a protein-fat diet) are commonly to be expected. At the present day our knowledge with regard to the amount of carbohydrate burned in diabetes is almost exclusively confined to the crude balance which can be struck between the carbohydrate ingested and the sugar excreted in the urine, the assumption being made that the difference between the two represented the amount of carbohydrate burned, since the evidence thus far accumulated indicates that relatively little, if any, carbohydrate is excreted in the feces. We may, however, by determining the respiratory quotient of a patient and noting the relation it bears to the theoretical respiratory quotient of fat on the one hand (0.71) and of carbohydrate on the other (1.00) obtain important information regarding the amount of carbohydrate burned. An accurate knowledge of the respiratory quotient in pathological cases may, therefore, be of fundamental importance, inasmuch as it pro-

vides an admirable index as to the character of the catabolism.

Furthermore, it is known that in the severe acidosis stage of diabetes there is a very marked increase in the total metabolism. This is readily shown in a study of the gaseous exchange. Under the conditions existing in this stage of diabetes, the problem is greatly simplified, for here one may assume with a high degree of probability that the carbon dioxide production results almost exclusively from the combustion of fat. Hence the determination of the carbon dioxide production alone may be used for calculating the total amount of the metabolism. Accordingly, if the total carbon-dioxide excretion of a patient with severe diabetes* is known, the total metabolism is readily computed by using as a factor the calorific equivalent of carbon dioxide corresponding to the combustion of fat, namely, 3.40 calories per gram of carbon dioxide, or 6.68 calories per liter.

FUNDAMENTAL PRINCIPLES UNDERLYING EXISTING METHODS OF STUDYING THE RESPIRATORY EXCHANGE.

A study of the respiratory exchange represents a stage in experimentation on metabolism that is entirely outside the experience of the ordinary clinician. The so-called metabolism experiments, which involve the measurement of the food intake and perhaps an analysis, in part, more or less complicated, of the urine and the feces, rest upon technic long established and relatively simple in carrying out. The technic required for a study of the gaseous metabolism is, on the other hand, very much more complicated, involving gas analyses, for the air in passing through the lungs gives up its oxygen to the blood and receives the carbon dioxide produced, thus resulting in a deficit in oxygen and a considerable increment in carbon dioxide. In entering upon such a study, one finds immediately that it is not a simple problem to separate and collect the inspired and expired air. Subsequent to this collection is the measurement of the volume of air expired or inspired, and finally the sampling and analysis of the gaseous mixtures. All of these processes present difficulties which are not directly comparable to the relatively simple collection and measurement of food, feces, and urine.

The respiration apparatus used in a study of the respiratory exchange are of two essentially different types. With one type the subject breathes through a nose-breathing or mouth-breathing appliance, and the inspired air and expired air are separated by valves or the expired air is conducted mechanically, by means of a motor and a ventilating fan, through absorbents which remove the carbon dioxide. In some forms of this type of apparatus the ex-

pired air is sampled by a spirometer or a meter and the carbon dioxide increment and oxygen deficit determined by analysis.

The second type of respiration apparatus is the so-called chamber method, in which the subject lies inside of a respiration chamber of suitable size, and accordingly his respiration is perfectly free and normal. The chamber may be entirely closed, and the carbon dioxide allowed to accumulate, the changes in composition of the air being determined by analysis from time to time or, as is almost invariably the case, it may be well ventilated, as was the chamber of Pettenkofer, and later that of Jaquet. Finally, the chamber may be so arranged that it forms a part of a closed circuit apparatus, with a ventilating air-current, the carbon dioxide given off by the subject being removed from the air by absorption with soda lime and the oxygen consumed being replaced by the admission of fresh oxygen, so that the ventilating current of air returns to the chamber with essentially the same composition as normal air.

Of the mouth-breathing type of apparatus, none is better known than that of Zuntz, or has rendered a greater service to physiology and pathology. The Zuntz apparatus has been subjected to a most critical examination and comparison with other respiration apparatus by Dr. T. M. Carpenter of this laboratory. The results have recently been reported by Dr. Carpenter in a monograph devoted to a comparison of the existing methods for studying the respiratory exchange.¹

Of the types of respiration chamber in common use, that of Pettenkofer and Voit involves only the determination of the carbon dioxide, but, as has already been stated, the direct determination of the oxygen consumption is absolutely essential. A chamber apparatus by means of which both the carbon dioxide production and the oxygen absorption can be determined has been successfully developed by Jaquet and simultaneously on the same principle by Hasselbalch, the latter using it for researches with infants. With this apparatus both the incoming and outgoing air is analyzed and the carbon dioxide content and oxygen deficit determined, the carbon dioxide production and oxygen consumption being computed from the results. The Jaquet method has been most successfully used and a number of experiments reported by Grafe in Heidelberg.

The determination of the carbon dioxide in both the ingoing and outgoing air of the respiration chamber is a relatively simple matter. The determination of the oxygen deficit, on the other hand, is a very complicated one. Practically the only gas analysis apparatus which measures exactly the oxygen deficit in the chamber method is that devised by Pettersson and recommended by Jaquet and by Grafe. The modified form of Söndén is even more exact. Extensive experience in this laboratory has shown, however, that

* The astonishing change in the respiratory exchange following the Allen fasting treatment is discussed later.

while the principle of determining the oxygen deficit in the outgoing current of air by means of the Sonden-Pettersson gas analysis apparatus is theoretically sound, and in the hands of a skilled analyst can actually be accomplished, it is extraordinarily difficult as well as time-consuming and tedious.

The type of respiration chamber in which there is no ventilation and the carbon dioxide is allowed to accumulate, is rarely used for human subjects, although occasionally used for animals. The respiration chamber with a ventilating current of air which passes through absorbents to remove the carbon dioxide, and to which oxygen is added to bring it to an approximately normal composition, was first used by Regnault and Reiset for small animals and later by Hoppe-Seyler for men. It has received its most extensive use for men in the laboratory of Wesleyan University, Middletown, Conn., and later in the Nutrition Laboratory. Recently admirable models of this type have been constructed by the United States Department of Agriculture in Washington, D. C., and by the Russell Sage Institute of Pathology in New York. With many of these apparatus the heat given off by the subject may also be measured directly.

The importance of determining the total metabolism under varying conditions of health, disease, muscular work, climate, temperature environment, etc., has resulted in an extensive amount of scientific research. It is probably safe to say that the determination of the total metabolism has been the basis of the development of practically all present-day forms of respiration apparatus. Even the respiration calorimeter developed at Wesleyan University, Middletown, Conn., and its successors were constructed primarily to measure directly the heat output from the body, and secondly, to measure the gaseous metabolism, with special reference to the total metabolism. In their construction a sufficiently large space was provided in the chamber to make the subject comfortable, and it was freely admitted that while the determinations of the carbon dioxide production were exact in short periods, the highest degree of accuracy for the measurements of oxygen consumption could be expected only in relatively long periods.

The simple universal respiration apparatus devised in the Nutrition Laboratory was intended to serve as a substitute for these costly respiration calorimeters, and to make more available the clinical use of studies of the respiratory exchange. It was assumed that subjects could breathe normally through nosepieces or a mouthpiece. While especial stress was laid primarily upon measurements of the total metabolism, such respiratory quotients as were found were usually assumed to be correct and probably not vitiated by the method of measurement. Nevertheless, it is of special importance to bear in mind that in the development of practically all

forms of apparatus for measuring the respiratory exchange, emphasis was laid primarily upon their capability for measuring the total metabolism and only incidentally on the measurements of the respiratory quotient. Gradually, however, the importance of the respiratory quotient has compelled investigators to seek to develop apparatus which will render this type of study easy, and we may now say that *only that form of apparatus which permits exact determinations of the respiratory quotient as well as of the total metabolism, need be seriously considered for the best clinical work.*

CRITIQUE OF EXISTING APPARATUS FOR THE DETERMINATION OF THE RESPIRATORY QUOTIENT.

The various types of respiration apparatus now in existence have certain technical difficulties which may reasonably be criticized. The determination of the respiratory quotient represents the highest stage of experimental technique, since the value of this factor is affected by errors in the determination of either the carbon dioxide content of the air or the oxygen deficit. We may, therefore, confine our criticism of existing apparatus primarily to the accuracy of the determinations of the respiratory quotient. In studying the respiratory quotient with any type of apparatus, we have two classes of important factors to deal with, first, the physical or technical factors and second, the physiological factors.

TECHNICAL FACTORS.

From an analysis of the fundamental principle underlying the two main methods for determining the respiratory exchange, *i.e.*, the mouth-breathing or nose-breathing appliance method and the chamber method, it is obvious that for the determination of the respiratory quotient, the direct determination of the carbon-dioxide increment in the expired air and the oxygen deficit with the admirable methods of gas analysis now available, is probably the best method from a purely technical standpoint. The methods of Tissot, Speck, and Zuntz belong to this class.

As the air passes through the lungs, oxygen is removed from it and carbon dioxide added. By an exact chemical analysis of the air entering and leaving the lungs, the deficit in oxygen as well as the increment in carbon dioxide may be determined; using these data and making minor assumptions, the respiratory quotient may then be computed. As commonly carried out this fundamental method involves either nose-breathing or mouth-breathing appliances, and yet it should be here pointed out that the chamber method of Jaquet and Hasselbalch does not in reality differ fundamentally from the methods of Tissot, Speck, and Zuntz. Theoretically, these latter methods should be so modified as to include the cutaneous respiration as, indeed, is the case with the Jaquet method, but for the present

we may disregard entirely the question of cutaneous respiration* and maintain that the method is technically perfect.

Those methods involving the determination of carbon dioxide production and oxygen consumption by two independent procedures, each with its possible individual errors, are theoretically inferior. This criticism applies to the respiration calorimeter and to the universal respiration apparatus, but does not apply to the Jaquet-Hasselbalch chamber. Yet the innumerable control tests with burning alcohol and ether have shown that, in actual practice, this criticism is disproved, for results with a very high degree of accuracy are usual in such control tests. As a consequence we may state that both methods have now been brought to technical perfection.

PHYSIOLOGICAL FACTORS.

The physiological factors are less often borne in mind. The essential differences between the two forms of apparatus from the physiological standpoint are, in the first place, that the subject is in one instance breathing with a mouth-breathing or nose-breathing appliance and consequently with the nose or mouth firmly closed, and in the other he is lying in an atmospheric environment not essentially different from that of an ordinary room. Physiologically, it is important to consider whether there are any abnormal features in either of these conditions which could affect, in any way, the determination of the respiratory quotient. To be capable of significant interpretation, the respiratory quotient should deal not with the carbon dioxide *excretion* and oxygen *absorption* during a given time, but with the carbon dioxide *production* and oxygen *consumption*. Between carbon dioxide excretion and carbon dioxide production there may be a very great difference, for there may be a change in the preformed carbon dioxide in the body and thus a false respiratory quotient would be obtained. Likewise there should be no change in the oxygen physically absorbed, *i.e.*, chemically uncombined in the body fluids.

A superficial inspection will show that there is much more liability of difference between the carbon dioxide *excretion* and the carbon dioxide *production*, than there is between oxygen *absorption* and oxygen *consumption*. Of the errors liable to affect the residua of preformed carbon dioxide in the body, we may note first a mechanical alteration in the ventilation, such as excessive ventilation ("Auspumpen") or retarded or decreased ventilation, the first resulting in an excessive excretion of carbon dioxide and the second, in the retention of carbon dioxide or an accumulation of preformed carbon dioxide in the body. In addition to these mechanical alterations in the ventilation, there may be a chemical alteration in the carbon dioxide which may result from a change in the acidity of the blood,

thus causing a change in the residua of carbon dioxide, wholly independent of the carbon dioxide production. It is probable, also that sleep may affect the mechanics of ventilation and, possibly, results obtained with subjects who are asleep in one experimental period should not be compared with those obtained in another period while the subjects are awake. This question should be carefully studied. Unfortunately, however, methods of studying the respiratory exchange which involve the use of breathing appliances attached to the face practically preclude such study during deep sleep.*

PRIME REQUISITES FOR A METHOD OF STUDYING THE RESPIRATORY EXCHANGE.

Prior to a description of the development or the construction of a new form of apparatus for the study of the respiratory exchange, it is important to take into consideration the conditions that must be met by such an apparatus, in the light of existing knowledge regarding the respiratory exchange. While it is admitted that most of the apparatus now in use in such studies is technically very satisfactory, especially for the determination of either the oxygen consumption or the carbon dioxide production, the technique for the accurate determination of the respiratory quotient still leaves something to be desired. Of the physiological factors the following should be striven for:

First, the subjects should be in complete muscular repose for some time, usually not less than 30 minutes, prior to the experiment. Since muscular activity is necessarily accompanied by a greater carbon dioxide production and an increase in the ventilation of the lungs, which results in a more or less prolonged disturbance of the respiratory rhythm, this condition of muscular repose is important. Second, there should be free, untrammelled breathing with as little consciousness of the respirations as possible. Third, theoretically at least, the complete gaseous emanations from the body should be measured, *i.e.*, the respiratory exchange should be studied in such a manner as to include the cutaneous respiration. Fourth, there should be a uniform condition of awake or asleep. Since during sleep complete muscular repose is probably more easily secured, sleep is preferable. Fifth, the experimental period should be sufficiently long to equalize any minor, transitory changes in the respiratory type or rhythm. Theoretically the period should be as long as it can be without a change in the body storage, *i.e.*, until a change in the quotient is normally to be expected by a depletion in glycogen or sugar storage.

In our plans for the study of clinical cases and, indeed, cases with which there may be at the beginning abnormal respiration, it seemed impossible, owing to the known abnormalities of

* Commonly assumed not to exceed two per cent. of the total gaseous exchange.

* With long-trained subjects, Dr. T. M. Carpenter has recently most successfully accomplished this.

mouth-breathing or nose-breathing appliances, to consider any but the respiration chamber method. While one may say that the placing of a subject in an enclosed chamber for the purpose of studying the respiratory exchange is a distinctly abnormal procedure, repeated experiments with the large calorimeters have shown that, except in very rare cases, the subject immediately adjusts himself to the conditions and frequently sleeps through the entire experimental period. On the other hand, the insertion of the nosepieces or the mouthpiece is almost invariably followed by a distinct alteration in the type of respiration, even though often there are no external evidences of discomfort. This is no more sharply shown than when pneumograph records are secured of the respiration with the subject breathing normally and comparisons made with records obtained with the subject breathing through a mouthpiece or nosepieces. Very noticeable alterations of the respiratory type are almost invariably found, especially with untrained subjects. Furthermore, personal conversation with many physiologists, both in America and in Europe, has led us to believe that it is the almost universal opinion that breathing through nose or mouth appliances, save in the case of exceptionally well-trained subjects, produces an abnormal type of respiration.

Consequently, in deciding upon a method for studying the respiratory quotient to be developed in the Nutrition Laboratory, the original plan was to construct a chamber which would meet all of the conditions requisite for successful experimentation and use it attached to the universal respiration apparatus. This method seemed especially feasible, as smaller chambers had been successfully used with this apparatus in studies with dogs and infants. In devising this respiration chamber we profited by the previous experiences of the Laboratory with the large chambers used in the respiration calorimeters and attempted in so far as possible to eliminate all particularly troublesome factors.

Recognizing, also, that any form of apparatus so complicated and costly as the respiration calorimeters in the Nutrition Laboratory and the Russell Sage Institute of Pathology was practicable for only a very few hospitals, the attempt was made to develop a respiration chamber for use with the universal respiration apparatus which would provide for the measurement of the carbon dioxide production and the oxygen consumption of patients in relatively short periods and still not be prohibitive in cost. It was not possible in such an apparatus, therefore, to introduce costly appliances for the direct measurement of the heat output. Fortunately, however, almost all of the evidence that has accumulated at the present time points to the fact that the larger proportion of experiments may well be made by determining the heat production indirectly from the measurements of the carbon

dioxide production and the oxygen consumption, provided that these are accurate.

A detailed description of the apparatus as finally developed and a number of results obtained with it on pathological subjects are given in Part II of this paper.

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(To be continued.)



STUDIES OF THE BASAL METABOLISM IN DISEASE AND THEIR IMPORTANCE IN CLINICAL MEDICINE.

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IN a recent paper, Professor Lusk has referred to the calorimeter as the interpreter of life processes.¹ This might be broadened to calorimetry, and calorimetry, as I shall presently explain, can be carried out without a calorimeter.

What is calorimetry?

As generally used at present, the term includes (a) the determination of the heat given off by an organism, by actual measurement; that is, the heat elimination; and (b) the calculation of the heat production from the gas exchange. The former is called direct, the latter indirect calorimetry. Direct calorimetry can be done only by means of the calorimeter, an instrument costing several thousand dollars; indirect calorimetry, on the other hand, can be carried out with any of a number of different types of respiration apparatus, the cheapest of which need not cost over \$75.*

Studies of the gas exchange in man and animals have been made by scientists since the days of Lavoisier, but it is only comparatively recently that Magnus-Levy,² and more particularly the workers at the Russell Sage Institute at Bellevue Hospital, New York,³ have shown the importance of calorimetry in internal medicine.

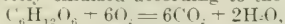
The elimination of heat and the production of heat, as determined by direct and indirect calorimetry, respectively, usually agree within a few per cent. so that studies by the latter method alone will serve most purposes. When one obtains the elimination of heat by direct calorimetry he expresses the result in heat units—calories. If, now, we wish to calculate the heat production in calories, we may do so by determining the oxygen absorption and the respiratory quotient. The latter is the volume of carbon dioxide eliminated divided by that of the oxygen absorbed in any given time unit.

* I refer to the Douglas respiration apparatus, which may be had from Siebe, Gorman & Co., London.

The respiratory quotient is of importance because it is an index of the kind of material being burned in the body. In the case of any given food substance, whether burned in the body or in a retort, the consumption of a definite amount of oxygen will result in the evolution of a definite amount of carbon dioxide. In other words, the ratio CO_2 will be a constant, for any given

O_2 substance, but will vary with different substances according to the structure of their molecules. The more highly oxidized a substance is at the start, the smaller the amount of oxygen that will be required to complete the oxidation, hence the higher will be the ratio $\frac{\text{CO}_2}{\text{O}_2}$.

Of the three classes of substances that may be burned in the body, carbohydrates, fats and proteins, we know the respiratory quotients. For example, in the case of grape sugar, which has an empirical formula of $\text{C}_6\text{H}_{12}\text{O}_6$, and which is completely oxidized according to the reaction



there will be given off the same number of molecules of CO_2 as were absorbed molecules of oxygen (and in the case of gases according to Avogadro's hypothesis, equal numbers of molecules make equal volumes at the same pressure and temperature); hence the respiratory quotient, $\frac{\text{CO}_2}{\text{O}_2}$, of grape sugar is 1.00. In the case of fats,

however, substances less highly oxidized than sugars, but also completely burned in the animal body, relatively more oxygen will be required. With sugar, oxygen was required to oxidize the carbon only; with fats some is also required to oxidize the hydrogen. Therefore the respiratory quotient of fat will be below unity. As a matter of fact, it is .71. Proteins occupy an intermediate position, having a quotient of .81. Knowing the theoretical quotients, then, of carbohydrates, fats and proteins, and having obtained a subject's respiratory quotient by experiment, we can calculate how much of his total heat production is due to the combustion of carbohydrate, of fat and of protein.[†]

In addition to knowing the respiratory quotients of the three classes of foods, we also know their heats of combustion, and since they produce the same amount of heat when oxidized in the body as when burned in a retort, it has been possible to calculate the value in calories of a liter of oxygen for any respiratory quotient between .70 and 1.00.[‡]

Hence if we know the respiratory quotient and also the oxygen absorption, we can calculate the heat production thus:

[†] In the case of proteins this statement is not strictly true, for proteins are not, like fats and carbohydrates, completely oxidized. To be absolutely accurate we should have to take the urinary nitrogen into account. For routine work, however, the protein metabolism may be disregarded since the R. Q. of the non-protein katabolism differs very little from that of the total.

[‡] For these values see Williams, Rine and Lusk: Jour. Biol. Chem., Vol. VII, p. 357.

Oxygen absorption per hour	×	Calorific value of oxygen for the R. Q.	=	Calories per hour
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which, in case the oxygen absorption were 12 liters an hour, and the respiratory quotient were .85, would become

$12 \times 4.863 = 58.4$ calories per hour, 4.863 being the calorific value of oxygen for a quotient of .85.

So much for methods of calculation. The next problem is in regard to what constitutes the normal metabolism and what factors may alter it. It is not my purpose in the present communication to discuss these questions, it is merely to point out their possible clinical importance. To answer the second question first, I may say that the taking of food, the doing of muscular work, and the exposure to cold, are the common factors which cause an increase in heat production in the normal individual. In the field of pathology, fever, acidosis and certain disturbances in internal secretions may also cause a rise.

Now it will be asked what constitutes the normal heat production, and is it a constant or a variable? It is very definitely a constant provided we use for comparison the minimum or, as it is more commonly called, the basal metabolism. By basal metabolism is meant the heat production when all the extraneous elements previously mentioned, food, muscular work, cold, etc., are eliminated. We can determine this basal metabolism in practice by having the subject at complete muscular rest, in the post-absorptive condition (that is, fourteen or more hours after food) and in an ordinarily warm room. If the effect of food, cold and muscular work are ruled out the metabolism will be found in any individual from day to day and from year to year (provided his weight remains the same) to vary very little. Further, it has been found that the metabolism of one organism is comparable with that of another, provided the total heat production of each is divided by the surface area of their bodies. This law was shown by Rubner to hold for all warm blood animals. Per unit of surface area, a mouse, a fowl and a man have the same basal metabolism.

Recently Du Bois⁴ has made it possible to determine the surface area in man with great accuracy by means of calculations based on a number of linear measurements of the body. Using this formula, I have found the average basal metabolism of 16 normal men and women to be 38.8 calories per square meter an hour.⁵

This figure agrees quite closely with that obtained at the Sage Institute, and the average variation from it was only $\pm 4\%$, and the extreme, less than $\pm 10\%$. Following the Sage investigators, therefore, I shall consider any metabolism abnormal that is more than 10% from the average figure.

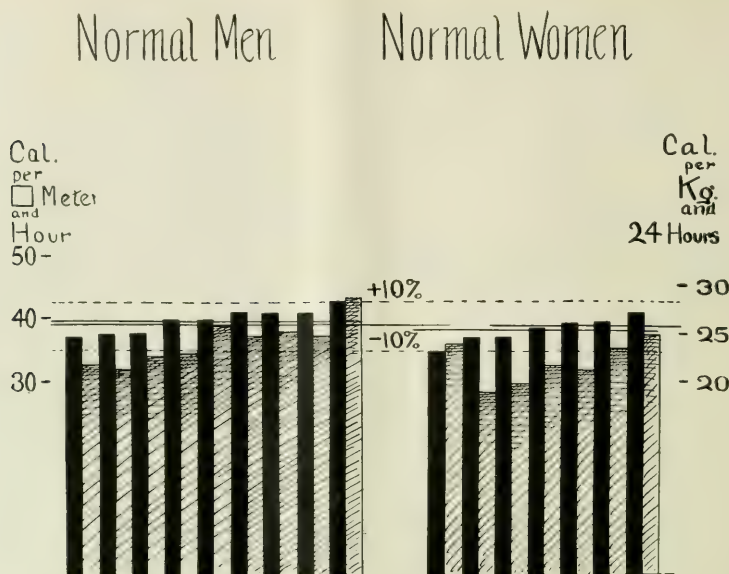


FIG. 1. The basal metabolism of a series of normal men and women. The black columns represent the metabolism per square meter and hour, the shaded columns, that per kilogram and 24 hours. The solid horizontal line represents the average of the series; the interrupted lines, a 10% variation above or below the average. The subsequent diagrams are all constructed on the same plan as this one. The base line in each case is zero, so that the height of the columns indicates the actual amount of heat production.

That the metabolism is more nearly proportional to the surface area than to the body weight will be seen by a glance at Fig. 1. The black columns representing the metabolism per square meter, are more nearly the same height than the shaded, which represent that per kilogram of body weight. This fact becomes more striking in Fig. 2, where the metabolism of two very fat women is contrasted with that of a woman of normal build, and a rather thin man. The four black columns representing the surface area relation are all within 10% of the average, whereas the shaded columns representing the weight relation are, in the case of the fat subjects, 40-45% below the average.

It may now be asked of what interest is all this to the internist. A little consideration will make it apparent that it is of very distinct interest. No one will deny the importance of the body temperature, of the pulse, or the blood pressure, yet about the only information we get from the last of these is that if constantly elevated the patient probably has chronic nephritis, or arteriosclerosis, or both, facts that we could probably arrive at by other means.

In the basal metabolism we are dealing with a factor nearly as constant as the body temperature, and because of the light it throws upon the calorific requirements of the body, quite as interesting.

For example, the basal metabolism of a 60-kg.

man might be 1,500 calories a day. This would be his heat production if he lay quietly in a warm room all the twenty-four hours. When he leads a life of moderate activity this may become 3,000 to 4,000 calories. Now in severe Graves' disease the basal metabolism may be doubled, so that the same man if he had that malady might have a basal metabolism of 3,000 calories and an actual metabolism very much higher. This at once shows that in order to keep patients with this disease in equilibrium they must be fed very many more calories than a normal individual of similar size and under like circumstances. The same applies in typhoid fever as shown by Coleman and Du Bois⁶ and hence the advantage of their high calory diet.

During the past two years I have had an opportunity to make various studies of the basal metabolism in the medical wards of the Massachusetts General Hospital. The apparatus used for the oxygen and carbon dioxide determinations was that of Benedict.⁷ After a series of normal individuals had been secured the work lay chiefly in a study of thyroid disease and of obesity.

Thyroid cases are particularly interesting since in hyperthyroidism there is a marked rise, and in hypothyroidism a marked fall, in the basal metabolism. In Fig. 3 are shown a series of nine cases of typical exophthalmic goitre. The metabolism in all of them shows a marked rise,

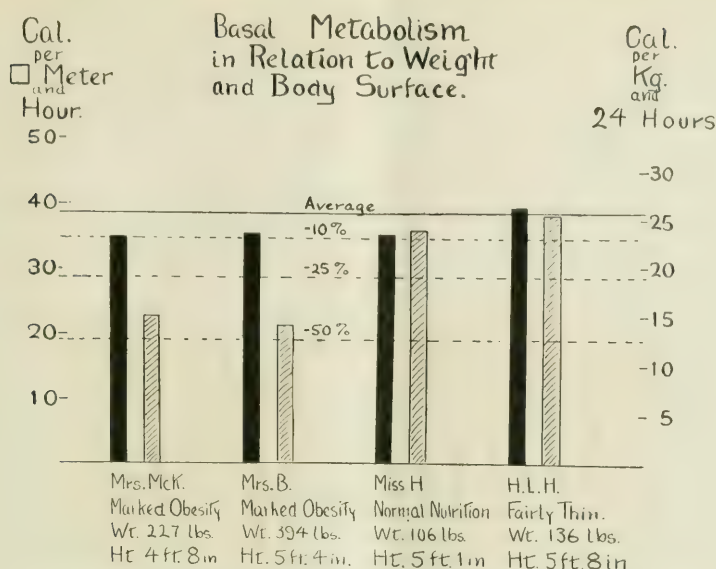


FIG. 2. The basal metabolism in obese and normal subjects, showing the close relationship of the metabolism per unit of body surface and the wide divergence of that per unit of body weight.

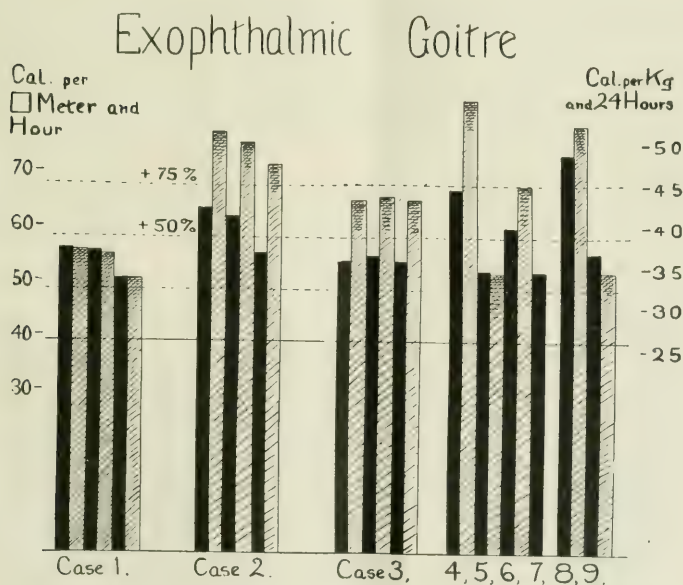


FIG. 3. Basal metabolism in Graves' disease. The third column in Case 1 was after one x-ray treatment, and the third in Case 2 was after hemithyroidectomy.

anywhere from 30% to 80% per square meter, and still more per kilogram, this latter being due to the great emaciation that many of them show.

This marked rise in hyperthyroidism is very interesting because, so far as is known, so marked a rise occurs in no other condition in which fever is not present. These patients were all afebrile when studied. A slight rise in the metabolism may occur in acidosis, that of diabetes or of uremia, for example, but it seems likely that a marked rise (50% or more) may be used as factor in the differential diagnosis of hyperthyroidism.* Early Graves' disease is sometimes confused with early phthisis. I have not as yet been able to make any determination on the latter, but one advanced case of phthisis that I observed showed a normal metabolism.

In addition to the fact that an increased heat production is a characteristic of hyperthyroidism, there seems to be good evidence that the severer the intoxication the higher the metabolism.

Case 1, a middle-aged woman, on whom three observations are reported, was a very severe case with all the classical signs of Graves' disease, marked tachycardia, tremor, nervousness and eye signs. The third observation was about three weeks after the first, and during the interim she had been on the hydrobromide of quinine and in addition had received one x-ray

treatment. A moderate fall in the metabolism had occurred.

In Case 2, also a severe one, the first two observations were made before treatment was instituted and the last three weeks after a hemithyroidectomy. Here, again, the metabolism decreased somewhat. In both cases the fall was coincident with subjective and objective improvement.

The three observations on Case 3 extended over a period of five weeks, during which time she was getting x-ray treatment. No fall in the metabolism took place, though clinically she was better. She was not so ill at the start as Cases 1 and 2.

Case 4 was a very advanced and malignant type with great emaciation, who later died following ligation of the thyroid arteries.

Case 8 was an early case with only slight tachycardia and eye signs, but with extreme nervousness and definite thyroid enlargement.

Cases 5, 6, 7 and 9 were all moderately severe cases, none of whom had had any treatment when the determinations were made. Of these Case 5 deserves comment because she had had Graves' disease seven years before but had apparently been cured by hemithyroidectomy followed by x-ray treatments. A few months before my observation was made, symptoms of Graves' disease had returned and at the time of examination there was marked enlargement of the remaining half of the thyroid, with bruit, eye signs, tremor, tachycardia and nervousness.

Reference to Fig. 4 will show that in myx-

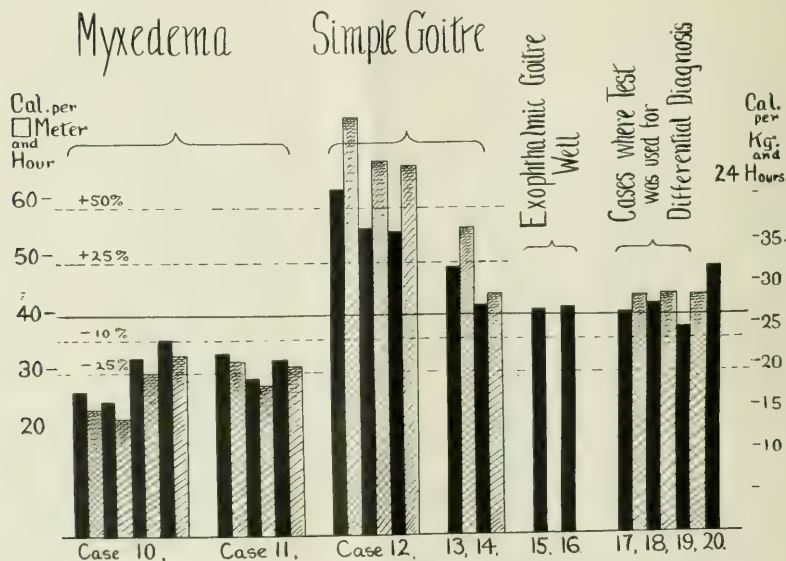


FIG. 4. Myxedema and atypical thyroid cases.

* A slight rise in the metabolism, so Dr. Du Bois writes me, occurs in such conditions as acromegaly, dyspnoea, anaemia, and cancer, but these conditions can easily be differentiated from hyperthyroidism.

edema the metabolism shows the reverse change to that found in hyperthyroidism. Cases 10 and 11, both typical myxedema, who had never taken thyroid gland, showed a marked reduction. The last two columns in Case 10 were after thyroid administration had been begun and show a tendency for the metabolism to increase toward normal.

Case 12 was a patient with a large cystic goitre of long standing, who recently had begun to have symptoms of hyperthyroidism, tachycardia, tremor, nervousness, etc., but no eye signs. The high metabolism found makes it seem certain that she actually did have some hyperthyroidism.

Cases 15 and 16 had both had typical Graves' disease in the past, but were completely recovered when observed; both showed a normal metabolism.

Cases 17 to 20 were obscure cases where hypothyroidism was suspected and the test was done as a means of differential diagnosis.

Case 20 was a tachycardia of unknown origin. Electro-cardiography pointed toward a cause outside the heart, and that, together with the increased metabolism and nervousness, led us to consider it a case of hyperthyroidism, even though typical signs were lacking.[†]

The second group of cases that I have given most attention to is that of obesity. In Fig. 5 the results obtained in ten cases are shown.[‡]

At this point I must mention the fact that with increasing years the metabolism gradually declines[§] so that it is not fair to compare the metabolism of a person of fifty years with my average figure of 38.8 which was obtained from

[†] These thyroid cases will all be published in full in a subsequent paper.

[‡] Of these ten, Cases 21, 24, 25 have been published. (See Means, J. H., Jour. Med. Res., Vol. xxvii, p. 121, 1915.) The others will be published in detail in the near future.

a series of persons between twenty and thirty. Some of the obese subjects were well over thirty (Cases 21, 23 and 25) and for them 35 calories per square meter and hour would be a fairer standard than 38.8. Using 35 calories as a standard, then, it will be found that Cases 21, 23 and 25, all of whom were enormously obese, were well within 10% of the standard. In Case 22 some of the observations fall slightly below the —10% line. So also do Cases 24 and 26, but not nearly to so marked a degree as the two cases of myxedema. Cases 27 to 30, which comprise all the men, are within 10% of the normal. In Cases 24 and 26 there was some clinical evidence that a disturbance of internal secretion was present. Neither of these cases would be considered more than moderately obese in comparison with Nos. 21, 22, 23 and 25.

A few miscellaneous cases were collected. One of Addison's disease, one of myasthenia gravis, one of Raynaud's disease all showed a normal figure. A case of pernicious anemia with a hemoglobin of 50%, also showed a normal metabolism. In pernicious anemia with a lower blood picture, Meyer and Du Bois have found a slight increase due, they think, to an increased blood flow and utilization of blood oxygen.

In regard to the kind of katabolism in these various conditions, as shown by the respiratory quotient, we cannot say a great deal. Benedict⁹ has shown that the *nüchtern* quotient in man is influenced to a marked degree by the amount of carbohydrate in the previous diet. As in the majority of these cases the diet was not measured we can draw no definite deductions.

In conclusion I should like to emphasize the following points:

1. Basal metabolism can be readily studied

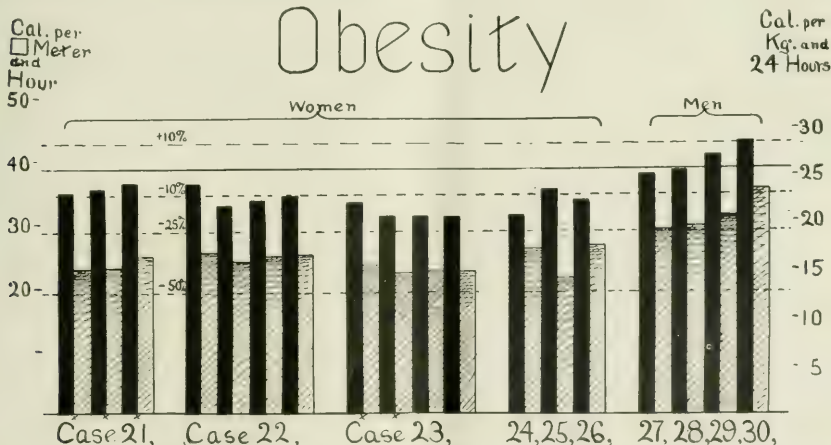


FIG. 5. Basal metabolism in obesity. Cases 21, 23 and 25 being considerably older than the subjects in the normal series, it is probable that for a standard we should take 35 calories per square meter and hour, which would make them lie within 10% of the normal, as explained in the text.

in a hospital clinic with comparatively inexpensive apparatus.

2. The normal basal metabolism is a fairly constant affair, and hence wide variations from it in disease are of interest to the clinician.

3. A marked rise occurs in hyperthyroidism.

4. A marked fall occurs in hypothyroidism.

5. In regard to hyperthyroidism it seems probable that the basal metabolism furnishes

(a) The best index as to the severity of the disease, and hence is a quantitative means of following the course and of judging of the effectiveness of treatment; and

(b) A valuable aid in differential diagnosis.

6. Enormous grades of obesity are possible in the presence of a normal basal metabolism.

7. When a reduction in the metabolism was found in obese subjects there was also clinical evidence of defective internal secretion.

8. A clearer conception of the food requirements in disease is furnished by the basal metabolism than by any other factor.

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THE PHYSICIAN AND THE PREVENTION OF INDUSTRIAL ACCIDENTS.

By HERBERT J. CRONIN, M.D., CAMBRIDGE, MASS.

WITH horror we read tales of the jungle where the wild beast leaps from his lair, seizes a human victim, and slowly devours him in spite of his futile efforts to escape. Mentally we picture his struggles to avoid the pitiless jaws, hear the crunching of bones and the weakening cries for help. Our imagination is fired and we fancy ourselves shooting the beast and rescuing the unfortunate. Then, it is dismissed from our minds as merely fiction,—such things do not happen nowadays. Yet almost daily in this country a workman will be seized by a huge machine and drawn into its cruel crushing gears. It is more powerful, merciless and destructive than the beast; it quickly kills or horribly mutilates. A campaign is being waged for the protection of our workmen from such disasters. It was first brought to the attention of the public by the Saffey First slogans. Accident prevention in industries is now a topic of first importance; yet

the medical profession has not been actively enlisted in this campaign nor has there been an organized effort to interest them.

Until the passage of the Workmen's Compensation Acts, accident prevention was given little consideration. Labor was cheap, and if a man was injured, it caused but an expression of passing regret or sympathy; he was dropped from the payroll and another filled his place. He was allowed to seek his own help; the business that caused his injury had no interest in him. Labor was scrapped in the same way as the machines it worked upon. We had a superabundance of foreign labor, which has been one of America's greatest assets; it has done the hard, laborious work of the country and our mines, steel factories and mills have depended upon it. It is fortunate that we have started this campaign



FIG. 1.—Shows how a boy's arm was lost on a mule-spinning frame.

to conserve labor, for it is doubtful if we shall receive many men from Europe after the war. They will be kept home to build up their devastated countries.

For years plants have taken precaution against fire. They have had local fire organizations, apparatus, sprinklers and other safeguards. They were proud of their efforts because they not only protected the plant from destruction by fire but helped to reduce the fire insurance rates. Yet the same firms did nothing to safe-guard the lives of employees from death-dealing machinery. Employees were expected to look after themselves and it was their own loss if they were injured. If the machine was dangerous to operate, they must use all due care; but no attempts were made to make a dangerous machine safe until the advent of the Compensation Laws. Now the costs of the hazards of an industry are charged up to that industry. Many accidents mean increased premiums. It is business policy to try to prevent accidents and place

safe-guards on machinery. The act has brought about an almost socialistic tendency on the part of some employers. For the first time they are thinking how the employee lives when not at work; for it is obvious that if he does not get enough food to eat, is unable to support his family, home conditions are bad or that he is in debt, he will not be able to do good work and will also be more liable to injury. This act is the most advanced piece of social legislation in modern times. It has brought about the application of practical Christianity to industrial labor and at last, man is more than mere material that can be cast aside without thought.

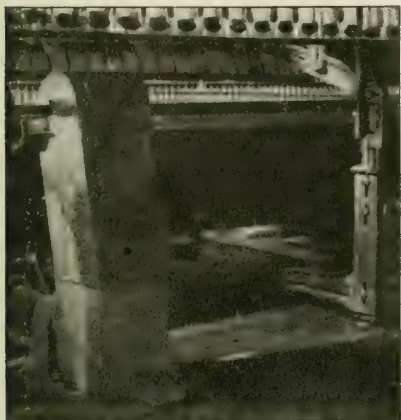


FIG. 2. Illustrates same spinning frame, shown in Fig. 1 with a guard in place. (1915 report of Massachusetts Industrial Accident Board).

The physician can do much to assist this campaign. He sees the accident first, dresses it and has the patient under his care. He can get a true history of how it occurred, look into the physical condition of the patient and decide for himself from the injury how it may have been caused. The recurring cases will be strongly brought to his attention. Our youngest interne at any of the metropolitan hospitals quickly recognizes by their frequent recurrence the causes of the common traumatisms; he knows the crush from the printing press, the mangling by gears, the buzz-saw fingers, and burns from molten metals. The doctor can inspect the site of the accident before the real cause of the injury, such as an oily floor or broken board, is removed. Most of the large plants have a physician in constant attendance. In the smaller plants that send their accidents to the hospitals and have no physician in their employ, the family physician of the manufacturer can draw his attention to these reforms and advise him in this respect. Technical knowledge is not necessary in giving advice for the correction of a large percentage of accidents. It is merely good

common sense. It requires little more ability than is demanded of the ordinary inspector of a Board of Health; for so many accidents are caused by such simple things as obstructions, unguarded pits or floor-openings. We do not expect that a physician will design intricate guards for gears or belts. But he can see the need of such a guard and advise the manufacturer of it. He need do but a little reading and then observe men at work and he will have a working knowledge of this subject and be able to be a big factor in the campaign.

There are many common, well-known principles that apply to accident prevention in most mills or factories. It is best that all guards should be made of steel or cast iron, for the wooden ones become oil-soaked and add to the fire hazard as well as not giving the best protection. When a man gets caught in a machine, it is first necessary to shut off the power; for this purpose, every department should have some arrangement situated at convenient stations so that the power can be quickly stopped. In order that the employees will not lose their heads when an accident does occur, frequent drills should be held on the method of stopping the power.

Belts are a daily cause of serious accidents. Men are caught and whirled around shafting or crushed on the drums; women have had their hair entangled and have been scalped. If a belt creeps from the loose to the tight pulley, the machine is unexpectedly started, with serious results. Belts can be completely guarded by various inventions and with the use of belt-locking devices on the belt shifters, the moving belt accident can be prevented.

Moving shafting can be enclosed in pipes or other suitable enclosures. Set screws on these moving exposed parts can be sunk below the shaft surface. A solid collar or any of the various safety screws can be used. When a man gets his foot caught on a set screw, the injury, although not fatal, is mutilating and incapacitating.

All inward revolving gears should always be protected, and can be so, without interfering with the efficiency of the machine or operator. Most of the new machines are built equipped with the proper guards. During the process of construction it is easy to build the guards into the machine, and the manufacturers should demand that type of machine. Most of the old machines with gears are still unprotected.

Portable ladders are a fertile field for accidents. Whenever possible, fixed ladders should be used and this is particularly so in boiler rooms. If portable ones must be used, let them be equipped with spikes, spurs or rubber shoes. The necessity for orderliness in packing supplies and the removal of all obstructions in passageways that might cause one to fall seem only too obvious. Likewise, it seems plain that stairs should have a handrail and that treads should

be of some non-slipping substance; that floors should have no loose or broken boards and that all openings as well as hatchways be guarded by a rail of sufficient height.

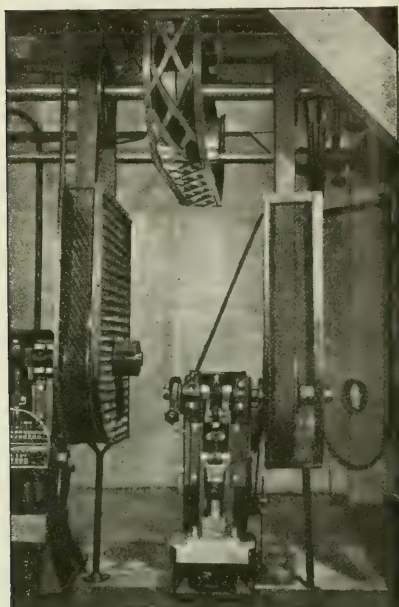


FIG. 3.—On the right, a small bench press with drive belt and pulleys enclosed. Side of the guard is so hinged that it may be opened. The press is equipped with a non-repeating safety type clutch. On the left is another press with belt and pulley guarded. Note the manner in which the overhead horizontal belt is guarded. (1915 report of Massachusetts Industrial Accident Board.)

The edge of a hammer or drill becomes easily mushroomed by constant use and these particles fly off, causing serious eye injury. Slight attention to the truing-up of these tools can prevent this. In other trades where flying particles are difficult to prevent, such as work on the emery-wheel or the pouring of molten metals, men should be compelled to wear goggles. If the manufacturer provides these at his own expense, there will be no excuse for not using them.

Freight elevator accidents are generally fatal or terribly mutilating. The common type of freight elevator is merely a platform without guards of any kind; its power control difficult and slow to operate. The elevator shaft is guarded by a cross-bar or improvised gate that is but a slight protection. Hence it is not surprising that so many night watchmen are found dead at the bottom of these shafts after stumbling over the gate in the dark. Although it is strictly forbidden by most employers that their boys operate or ride on the freight elevator, yet young people just out of school will attempt to run the elevator when no one is around. They

hop on and off the moving machine, put their heads out in the shaft to watch the elevator descend and play about the open pit. And then comes a news item of the fire department called to chop out some youngster who has been caught between the wall and the elevator, or more often, just a line announcing the fatality. Freight elevators can be just as well protected as a passenger one without impairing their efficiency. Proper gates can be put about the pit and the sides of the machine adequately guarded.

Insufficient lighting is a fruitful source of accidents and until recently has almost been ignored. In plants that work a day and a night shift, the proportion of accidents at night on the same work is larger than during the day, and this is explained largely by improper lighting. Sometimes machinery is adequately illuminated but the passes are dark, and when one goes from brightness to total darkness, is it surprising that he should fall down stairs or over hatchways? The modern factory has recognized these essentials and is almost as bright as a photographer's studio; the old solid brick construction with its few windows has been replaced by sides of glass. But even with all this daylight, huge machines with their belting will cast shadows. To correct this, the inside of the factory should be white in order to reflect all the light. White-wash becomes dirty quickly and is unsatisfactory, but the white enamel paints are giving good results. If artificial light is used, it is often improperly placed and causes eyestrain and other eye troubles, with the result that the men do not see well and accidents occur in the same manner as with insufficient light. It is needless to dwell on the necessity for proper ventilation which will take off the dust, poisonous gases and protect the employee's general health.

After all the practical devices have been put on machines, it has been shown that only about 35% of accidents can be so prevented. In order to supplement the work, every plant should start a safety organization among its employees. The general plan of such an organization is simple and easily carried out; but the heads of the plant must take an active interest in it and its policy, for if they allow dangerous and careless practices, the employees will do likewise. A safety organization can be started without increasing the pay-roll, for the work should not interfere with the employee's regular duties except in large plants where one employee is designated to be a safety inspector and spends his entire time at that work.

A simple plan for a safety organization is first to appoint a man of good judgment to be safety inspector and to work under the direction of the manager or superintendent. He can take charge of the routine work such as the safeguards on the machines, sufficient lighting, fire precautions, arrangement of materials in a safe manner, watch for careless and unsafe practices,

and report all serious accidents to the management. Next there should be a permanent safety committee, to be made up of, for instance, the chief engineer, shop foreman, and the chief mechanic. They should work in conjunction with the inspector, and pass on all his recommendations as an advisory committee, look into the cause of all accidents, and consider how they can be prevented. Finally and most important of all, a workman should be selected from each department to act as a general workman's committee. These men should be changed every month and in that time should make two general inspections of the plant. They will also look into all accidents in their own department and report them both to the advisory committee and the safety inspector. This will create an active interest in the men themselves who are the ones that have the accidents. They could also take up the instruction of new men who are put on dangerous machines, and by telling the dangers to the new man in his own language, prevent that common farce of English notices of warning or caution placed on machines, and expected to be read by an employee who cannot understand a word of English! A doctor should also be a member of this committee as medical advisor. The employees always have confidence in a doctor, for they know that he is working for their interests.



FIG. 4.—An inexperienced workman who got his hand caught in a gear. He has a real permanent injury. (1915 report of Massachusetts Industrial Accident Board.)

The by-products of industrial warfare are worse than those of real warfare. The soldier is given a pension and aided by the government.

What of the injured steel worker or miner? In the past, if an industrial worker lost a leg, he was discharged from the hospital with a hopeless future; no job, few opportunities for a crippled workman and no money to get an arti-



FIG. 5. Two Russian workers, who received identical injuries in the same year and in the employ of the same firm. They could not understand English, yet the report of the accident states that "he took his feet off the safety treadle contrary to our rules and instructions." They were feeding an embossing machine, and in an endeavor to straighten out the skin that was being embossed, put the left hand into the machine between the plates while it was in operation and with the above results. (1914 report of the Massachusetts Industrial Accident Board.)

ficial leg that was efficient. He became a wreck of our industrial warfare and usually drifted into an almshouse. Little consideration was given to the fact that he could be re-educated in his trade. Even the medical profession did not know the full possibilities of artificial limbs. With the advent of the Workmen's Compensation Act, there is a new stimulus to get these men back to work; for, if a man is not totally disabled and can do part of his former work or some other work, it will not be necessary to pay him total disability rates and that means lower premiums, as well as an application of Christian charity. In Europe today they are attempting to turn back the disabled soldier of war into a competent soldier of industry. Strange new schools are starting in which these men are learning to use their shattered bodies in useful occupations. Now with the aid of artificial limbs, the men are taught again what they formerly knew how to do, and are not total losses. The modern artificial limb is a marvelous piece of mechanism. With it armless and legless men are able to use delicate tools, climb ladders, and even play on musical instruments. Let us

do the same with men injured in our industries, and let the medical profession act as pioneers in this new work as they have in nearly every other social reform.

Memorial Address.

BENJAMIN E. COTTING, M.D.*

By H. WARREN WHITE, M.D., BOSTON.

WITH real pleasure I accepted this part of saying a few words concerning Dr. Cotting, for which honor the time allotted is all too short, yet it gives me a little opportunity to show my deep appreciation of his many personal kindnesses to me, and a chance for us to pay a little tribute to one of our *fathers* in medicine. Virgil's first line in the *Æneid* comes to my mind, "Arms and the man I sing, who first," etc. Oh, that I might sing from a full heart what I really feel we all owe tonight to this good physician who, amongst the first, placed such a high value on the *social* friendship of his confrères! Benjamin Eddy Cotting was the real *pater noster* of our Society. At a time when fierce rivalry, petty jealousies and false charges between members of the medical profession induced enmity and spite, when doctors manoeuvred to steal each other's patients, and when successful, theatrically pitched their predecessor's medicine out of the window,—this quiet, clerical-looking gentleman played the game fair and prospered exceedingly. Those were the days when, if a patient died, the doctor claimed he had not been called early enough, and, if he lived, he had been snatched from a deep, deep grave! At such a time our friend stoutly maintained that disease was generally self-limited, a part of the very plan of Creation, and that the real truth was, that the doctor hadn't done half so much towards the cure as the optimistic physician imagined he had done.

One of the great difficulties in the advance of medical science has been, that once a doctor has grasped and accepted certain ideas concerning disease, that belief easily becomes fixed and that possessor becomes a champion or defender of that faith. If real truth did not agree with such faith, so much the worse for real truth. Now, while Dr. Cotting was controversial and enjoyed a wordy war, as we look back upon those early days, we perceive that he fortunately was more nearly *right* as we see the truth today. The spirit of the times was more combative then than now, and while our friend, because of his aggressive attitude and open skepticism, was considered almost an enemy of the family physician (as some others are today), he really was endeavoring to clarify Truth by viewing her

from all sides and every angle. He possessed the heroic attitude of willingness to follow Truth, let her lead him where she would. So in those days while our founder was so ready to pitch into the hot argument, none was so ready as he to furnish the hot oysters, and to calm discussion with the cooling punch, and with most solicitous attentions heap confusion on the heads of his antagonists. A reader's paper never lacked discussion then as is so often the case today. It was oftentimes torn to shreds (figuratively) by furious attacks—attacks that included the writer as well as his paper.

Benjamin E. Cotting has been dead nearly twenty years. He would be 104 if alive now. When I first met him thirty-five years ago he was already sixty-nine years old,—a dignified ministerial old man full of years and honors. The rather frail, diminutive red-headed son of an Arlington baker had become most widely and favorably known as a scholar and philanthropist, a successful physician loaded with the highest of local honors! He had been secretary of the Massachusetts Medical Society. Later, when sixty-two years old, its vice-president, and then president. He had reorganized its methods, written its code of ethics, been influential in having committees appointed to see such code carried out officially and with dignity.

Thrice has our little Society been honored by its members becoming presidents of the Massachusetts Medical Society, viz: B. E. Cotting, G. W. Gay, and C. F. Withington.

Dr. Cotting was the *pater noster* of other societies than ours, notably the Obstetrical Society of Boston. He had with others purchased the BOSTON MEDICAL AND SURGICAL JOURNAL and for a while was its editor. He resented that from a most painful and sickly career. He was consulting physician to Boston City Hospital, honorary member of other state societies and corresponding member of the Royal Medical Societies of Greece and Italy; a Fellow of American Academy of Arts and Sciences. Enthusiastic in his love for science and medicine, it was said of him that the Massachusetts Medical Society was indeed his very religion.

After graduating from Harvard College (A.M.) at twenty-two years of age, he taught school and scrupulously paid back, to his father, moneys that had been advanced him for his education. Later he refused his portion of the family estate, asking that it be given to the others more needy than himself. He told us a story of those early days of school teaching. In his school was a refractory pupil fully as large as, if not larger than himself. He deserved a flogging, but considering his size, it was doubtful if Benjamin could do it. He tackled the big bully and whipped him and whipped him as long as he was able; then as the humor of the situation came over our young teacher, he could not help bursting out into a hearty laugh. Later he

* Read at the Fiftieth Anniversary of the Roxbury Medical Improvement Society at Young's Hotel, May 25, 1916.

heard this pupil blubbering under the school-house window—"Darned old red head, darned old red head, he licked me and then—and then he laughed at me!"

At twenty-five he graduated from the Medical School and settled in a small bare room, corner of Washington and Bedford Streets, in the year 1837. Here, and later on Winter Street, he starved along for about five years; picking up night calls, doing work for others in summer time, and finally becoming assistant curator of the famous Lowell Institute Lectures in 1841. This position influenced the whole course of his life greatly. It gave him the acquaintance of the rich Lowell family with its wide financial interests and probably did much towards the accumulation of his own fortune, through favorable investments in the valuable mill stocks of that period. Finally the opportunity he waited for offered itself in Roxbury. He had never intended to settle permanently in Boston.

Here Dr. Cotting lived in a cottage house (next to the Norfolk House) of very modest proportions—a house to which he repeatedly invited his friends and associates. His fifty-five years as curator of the Lowell Institute Lectures gave him a wide-spread acquaintance with notable scientists. Prof. Gould, Jeffry Wyman, and Prof. Louis Agassiz, at one of their meetings at this house, in sport, gave this cottage its pseudo-Greek name *κοσμάβιβον*, Kosy Kabbin, or, as he called it for short, the K.K. In this little house chloroform was first administered in America, and later they marvelled that their ignorant experiments fortunately did not prove fatal to some one. In this cottage was the birthplace of this Society fifty years ago, and the generous refreshments, provided by Dr. Cotting, contributed quite largely to the happy fellowship in science, a part he felt was as important almost as the scientific papers themselves.

Polite and most genial, Dr. Cotting never seemed at his very best, as when that little house was filled with his friends. Scholarly, witty, skeptical, and sometimes keenly sarcastic, he himself was the centre of every such gathering. The doctor had had a large experience in practice,—he had had the cream of society practice in those days,—his hospitality was exceedingly generous, his benefecences many, and such as his means justified, as shown by many public gifts that were well known, as well as by many more that were heard about only after his death. He was scholarly, graduating with honors; a P. B. K. man, and a European traveller. He crossed the Atlantic many times when such journeys meant serious effort and dangers compared to the present days. Dr. Cotting and his wife went with Louis Agassiz and his wife on a semi-scientific trip to Brazil, returning to America via Southampton, England. When Dom Pedro came to this country he stopped at the Kosy Kabbin, and in memory, Dr. Cotting named his old white

horse "Dom Pedro Secundus." He was a good talker and story teller and had a mind stored with wide information. He enjoyed a patient listener and to such he poured forth prodigally from his rich storehouse. Age never soured him—a most *delightful* "grand old man!" He came of a delicate tubercular family. He had the spare frame and fine face of a sensitive gentleman; his everyday ministerial Prince Albert coat, and even more his habit of always wearing "barn door pants" (much affected by the clergy of that period), made him a figure, with his long white hair of late life, one would never forget. While this Scientific Society celebrates this unusual occasion, let me appeal to your sentiment. I wish that more of our Society might have met on the old empty lot as some of us did before coming to our dinner tonight, in memory of the Kosy Kabbin and its former occupants. Here was the former centre of old Roxbury when Roxbury was only a country suburb of Boston. Dr. Cotting said there were just six physicians in regular practice when he came here to settle. At that time there were no curbstones, and sidewalks were merely earth paths along the travelled way. The streets were generally not lighted at night,—never when a moon was expected to shine,—and lanterns were carried by most pedestrians. South of Dover Street there were only a few houses. Tremont Street was a mere road, but little raised above the salt marsh, with only one house on it. There were few chance posts to hitch your horse and so amongst the first, if not the very first, Dr. Cotting adopted the horse weight with strap and snap, a great convenience. At that time Roxbury had less than nine thousand inhabitants, and in time, from the center of Boston, was about as far as Worcester is now. Dr. Cotting built up a large practice, and in spite of his benevolent methods, when he died his estate was worth a good round sum. He worked hard and gave freely. He boasted of making as many as forty-three visits in one day from early dawn to late night; of attending four births in different parts of the town in twelve hours, three male and one female, and as it was the 22d of February, the boys were all called George Washington and the girl Martha. In one year he treated, he said, three hundred and seven cases of typhus fever, a malignant epidemic of that type coming to Boston at that time. For fifteen years Dr. Cotting was trustee of the Roxbury Latin School and on a building committee with one other, completed what is now the present building on Kearsarge Avenue and, *mirabile dictu*, within the time and *appropriation* set, which fact he ever related with great pride.

He enjoyed the rôle of being a father in medicine to the young practitioner. One time an absurd story was started but soon cut short. It was reported around that Dr. Cotting always gave to a newcomer a horse or vehicle. It had some foundation inasmuch as he had given to three young practitioners one or the other of

these articles, rather worn perhaps, but with several years' good service still remaining in them. He had loaned money, paid rents as well as transferred families completely to these young doctors, remarking to the family, "Now, if anything serious takes place or you're afraid and affairs are going badly, I'll come in and be shoulders for this young man any time!" To me he admitted such favors were not always appreciated, for he minded the old saying, unfortunately true sometimes, "If you wish to make a man your enemy, do him a favor." His door was always open to these young medical friends, the only children he ever had, and such interviews were very profitable. He was a stickler for the fine points of professional etiquette and expected it from others. He would weigh with great nicety the pros and cons of a situation and was a most excellent umpire. A skeptic naturally by disposition, yet he was a most practical Christian in brotherly love. His faith was small, his bump of charity exceedingly overgrown, even almost to deformity. He was a real Nihilist as regards medicines, excepting only about three or four drugs. He was a good diagnostician and had a real gift in mechanics. He surely disapproved of women doctors and heartily hated the sight of a homeopath! His painstaking in little things was well illustrated by his insistence on his method of treating ingrowing toe nail, the radical cure of which his methods insure today.

Dr. Cotting told stories on himself with great enjoyment, a sample of which I must relate just now: As a large, full omnibus left its station in Eliot Square one day, a pompous self-constituted boss sat at the head of it. Overhearing a passenger at the other end of the vehicle relating how a Dr. Cotting had attended a recent fractured thigh, he shouted in a rough voice, "Who d'you say attended them?" On being answered "Dr. Cotting," the bully again exclaimed, "Dr. Cotting, Dr. Cotting, who in hell is he?" Dr. Cotting adds quaintly, "I took occasion at the first opportunity to render gratuitous service to that man's family, that he might recognize me as one of his neighbors; call the place in which we lived by whatever name he chose!"

I shall forever remember the hot debates he had with Dr. Henry Martin (his Dudley Street neighbor). These were at the Norfolk District Medical Society meetings. Dr. Martin was big, pompous and blustering, red-faced and apoplectic when exasperated. Dr. Cotting, thin, a trifle more pale, keenly sarcastic but triumphant in such wordy controversy. Our doctor, with great glee, would rise on such occasions to wonderful acuteness. Nothing he liked better than to smother brag and bluster with delightful wit. Like an expert swordsman he had chopped off the opponent's head without his being conscious almost of his defeat. He did like an argument, and enjoyed the game immensely.

He never kept office hours, preferring to pre-

serve his home as private and quiet as possible. His little house was filled with mementos of his long and successful career. All his life he exalted friendship and illustrated the value of making more friends rather than more money. He lived the motto of our Society, "Scientiae et Amicitiae." If medicine was *his* mother, so she is *our* mother too. Dr. Cotting was our most worthy father, of whom tonight we may well be proud! Science for our mother, Dr. Cotting for our father, "Kosy Kabbin"—the womb from which we sprung. Our pedigree then is complete. Let his life here be one of our cherished traditions! For a score of years Dr. Cotting's body lies a *mouldering in the grave*, but quite reverently I hail his most friendly spirit, which, in the fellowship of this Club he founded, still goes a *marching on!*

Clinical Department.

TWO CASES OF SYPHILIS OF THE LUNG.

By ARNER POST, M.D., BOSTON.

THESE cases of syphilitic disease of the lung are too valuable to be allowed to lie unpublished, even if the histories lack something in completeness.

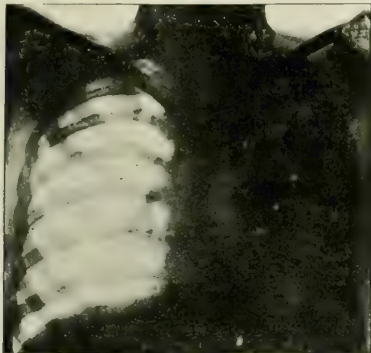
CASE 1 began as a primary sore of the lip, first seen on May 9, 1908. That was followed in due time by very severe constitutional symptoms, which were characterized as early malignant syphilis, and incapacitated the patient for work, but by September he was able to work again. At some time within the first two years, he had an attack of insensibility, which was followed by a hemiplegia, from which he entirely recovered in a comparatively short space of time. I saw him during the primary and early constitutional disease.

I next heard of him early in 1911, when I was asked to see him at his home. I found him huddled over the register, thin, cadaverous, constantly coughing and spitting. He was the typical picture of the advanced consumptive. His story was something as follows: He had been taken some weeks before with a cough which his first doctor had called bronchitis. This grew worse rather than better, and the diagnosis had been changed to pneumonia. As that persisted for some weeks, the sputum was examined for tubercle bacilli, with negative result. He was then sent to one of our larger hospitals, where he was tapped several times, but always without results. After that he returned to his brother's house, where I saw him. There is no record of the physical signs at that time, but there was absolute flatness on the left side which certainly had justified the tapping.

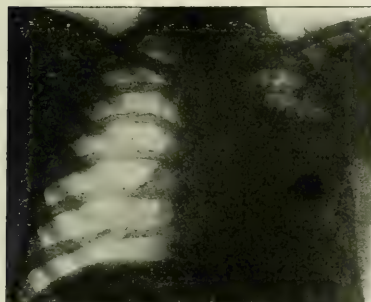
Bronchitis, pneumonia, tuberculosis, pleuritic effusion had all been considered and disproved. Examination of his sputum at that time disclosed neither tubercle bacilli nor spirochetæ. A new growth of some kind was to be considered, and in view of his history, especially of the severe forms

that his syphilis had taken, syphilis seemed a fair assumption, or at least a good working diagnosis. He was put upon antisyphilitic treatment, chiefly iodides, and his improvement was immediate and wonderful.

He began to improve under antisyphilitic medication, and as soon as he was able to go out, the radiograph labelled C. N. 1 was taken, on May 9, 1911.



C. N. 1. May 9, 1911.



C. N. 2. May, 1914.

His general health improved and his ability to work increased. About a year after his chest symptoms began, he followed me to the Boston Dispensary. Dr. George Sears, Associate Professor of Medicine in Harvard University, was kind enough to see him there and dictated the following account of his condition.

Diagnosis by Dr. Sears. Less movement of left side than of right in respiration. Contraction of left side antero-posteriorly, which is most marked at level of fifth rib. Apex beat of heart felt in fifth space almost in the anterior axillary line. Cardiac impulse visible over whole area between apex beat and the sternum. Cardiac dullness is limited on right by left border of sternum. Left chest in front dull to flat throughout except in small area extending from clavicle downward to third interspace and laterally from sternum to three inches of the left, where percussion note is clearer. Voice sounds, except over limited area of good percussion, are somewhat bronchial in char-

acter, and the fremitus is increased down to third interspace; below that both are diminished and are lost at base. Expiration is prolonged and high-pitched down to third rib, below which the respiratory murmur diminishes rapidly, until it becomes inaudible. Except for coarse, crackling sounds, heard on respiration over whole left chest, no râles are audible. Percussion note over right front is somewhat diminished in resonance. Dulness increasing downward to flatness over whole left back. Respiration high pitched with prolonged expiration to angle of scapula; silence below. Bronchial voice to angle of scapula; much diminished below that. Fremitus lost from mid-scapula downward. On deep inspiration a leathery sound is heard over upper third of back. Right back seems less resonant than normal, the respiratory murmur is somewhat diminished and expiration is prolonged and slightly raised in pitch. A few crackles are heard in S. S. F. on full inspiration.

Notes on his case are fragmentary. He had 606 on March 19, 1912; on March 20, 1913, his luetin test was positive.

C. N. has gained steadily in general condition. He works regularly at his trade, that of house painter, but his lung has changed little. He passes among his friends as a healthy man, but he gets out of breath quite easily.

CASE 2, L. M., is one of hereditary syphilis brought to the Boston Dispensary in July, 1913, by the Commission for the Blind. She was at that time 20 years old and had spent a large portion of her life among various public institutions. Her father was an alcoholic and apparently died of locomotor ataxia, and the mother of Bright's disease. There are three children living, one 29, patient 20, and a girl of 14. There were two miscarriages, three children died in infancy, one brother at four of spinal trouble, one drowned and one of heart disease. The patient had paralysis of the left side at six years, diphtheria at thirteen, was sent to Rutland at 17, with diagnosis of tuberculosis.

She first appeared at the Boston Dispensary as an undersized, undeveloped girl, so blind that she needed a guide, walking with a very distinct limp, and giving the impression by her answers to questions that she was a little deaf and also undeveloped mentally. It is difficult to put together in chronological order all her pathological experiences, but in addition to experience mentioned above, she has been four times at the Waltham Hospital,—for left hemiplegia, for an operation of some sort, and for pneumonia. She was ten months at the Rutland Sanatorium for tuberculosis, though no tubercle bacilli were ever found there or elsewhere. She was a patient of the Eye and Ear Infirmary, where tuberculin was administered. For a year the right eye has troubled her.

She has had trouble with one hip, which has been called tubercular, but it is not a destructive lesion. She has lines at the corners of the mouth. Left side of body smaller, no respiratory movement on the left side. Atrophied perineal group and foot-drop; left side of chest dull on front and back; heart displaced to left.

The illustration marked Patient No. 2, L. M., is her radiogram.

The resemblance of the radiographic pictures in these two cases is very striking. In both the

dark shadow is confined to one side; in both the heart is drawn toward the affected side.

Both patients are syphilitic. In neither have tubercle bacilli been found. It does not seem



Patient No. 2. L. M. Hereditary. May, 1914.

possible to avoid a diagnosis of syphilis of the lung.

I have recently seen a very similar radiogram in which there was no evidence of syphilis. There was a negative Wassermann and the autopsy proved the diagnosis of malignant disease.

These two cases were among the earliest to arouse interest in syphilis of the lung in this vicinity. Many cases more or less resembling them have been discovered since, some of which I have been permitted to see.

From all of these cases, the following conclusion seems justified:

Disease of the lung, in which consolidation is found in unusual positions, or limited entirely to one lung—in which tubercle bacilli have not been found—may be considered suspicious of syphilis. If the Wassermann is positive, the suspicion is much greater and may almost be regarded as a certainty.

Certainly, consolidation in unusual positions, with the absence of tubercle bacilli and the presence of a positive Wassermann, does not permit the diagnosis of tuberculosis. These cases show, also, the very important fact that syphilis of the lung occurs in hereditary cases, that is, among the young,—the very individuals who are most subject to tuberculosis.

Book Reviews.

Orthopedic Surgery. By EDWARD H. BRADFORD, M.D., and ROBERT W. LOVETT, M.D. Fifth Edition. One volume of 416 pages, octavo, illustrated by 369 cuts. New York: William Wood & Company. 1915.

The fifth edition of Bradford and Lovett's *Orthopedic Surgery* follows the same general plan as the previous editions, covering the many conditions which are of orthopedic concern in concise form. It is essentially a students' textbook, and as such perhaps the best work on the subject in the English language.

Typical cases and methods of treatment are illustrated generously, and almost entirely from photographs. This is especially helpful in demonstrating the method of application of apparatus.

The discussion of adult orthopedic surgery is less complete than the discussion of the orthopedic conditions of childhood. A very conservative attitude is taken toward certain of the newer methods of treatment, such as the operative procedures for the relief of spinal caries and the treatment of scoliosis, but the future may very possibly prove this conservatism to be wise. The book will undoubtedly continue to occupy the important place it deserves.

The Treatment of Acute Infectious Diseases.

By FRANK SHERMAN MEARA, M.D. New York: The MacMillan Company. 1916.

Dr. Meara, who is Professor of Therapeutics in the Cornell University Medical School, presents an admirable book. In limiting himself to the discussion of the treatment of acute infectious diseases he is able to present all the facts. Such chronic infections as syphilis and tuberculosis are purposely omitted, presumably because they are sufficiently excluded by the title of "acute infections," and also because the therapy of these two conditions constitutes separate monographs in each instance. Dr. Meara has adopted the plan of headings with sub-headings under each disease, with a valuable summary at the end of each chapter. The book reflects the personal opinion of the writer and avoids the long discursive résumé of all the various therapeutic procedures that have been recommended by various writers. Dr. Meara takes up in minute detail every important aspect of treatment, including nursing care, diet and caloric values, specific and symptomatic treatment. He avoids useless repetition by discussing certain fundamentals of symptomatic treatment in two early chapters. In the consideration of drug therapy he mentions only the few important drugs which he has personally found valuable. It is particularly refreshing to find a work of therapeutics that does not recommend the use of nearly all the drugs in the pharmacopeia as helpful in the stimulation in serious infectious disease. The index is unusually complete and valuable. All in all, it can be heartily recommended as a sound, adequate presentation of modern therapeutics of acute infectious diseases.

The Practical Medicine Series. Under the general editorial charge of CHARLES L. MIX, A.L., M.D. Vol. ix, Skin and Venereal Diseases, edited by OLIVER S. ORMSBY, M.D., and JAMES HERBERT MITCHELL, M.D. Vol. x, Nervous and Mental Diseases, edited by HUGH T. PATRICK, M.D., and PETER BASOE, M.D. Chicago: The Year Book Publishers. 1915.

These two volumes, appearing simultaneously in the Practical Medicine Series for 1915, continue the presentation of a summary of progress in their respective fields during the preceding year.

The volume on cutaneous medicine records a considerable amount of new material developed from the study of thermal injuries and venereal diseases among the warring European armies, and from investigation of the Wassermann reaction, epithelioma and blastomycosis in America. There is an appendix by Dr. Harold N. Moyer, on miscellaneous topics, among which are included feminism, social education, primitive medicine, early medical history of Dublin, various topics derived from the European war, and the anatomic and mechanistic conception of disease presented by Goldthwait in his article in this JOURNAL on June 17, 1915.

The volume on nervous and mental diseases presents a systematic review of recent progress in the neuroses, in diseases of the meninges, of the brain, of the spinal cord, of the ganglia and of the peripheral nerves. In the section on mental diseases especial attention is given to the relation between mental defect and delinquency, to insanity and the war, to dementia precox and to manic depressive insanity.

Both volumes are well illustrated with full page plates and a number of text cuts.

Physiology of the Amino Acids. By FRANK P. UNDERHILL, Professor of Pathological Chemistry, Yale University. New Haven, Conn.: Yale University Press. 1916.

Within the last fifteen years the whole subject of protein metabolism has advanced, from the stage of speculation, to an assured foundation of chemical and physiological knowledge. The immense importance of proteins in normal and pathological physiology makes desirable the widest dissemination of the recently accumulated information concerning them. Professor Underhill's book on the amino acids presents an attempt to bring this to pass. The book is, in general, well-designed and well-written. Such complex chemical formulae as are necessary, are written in a manner readily comprehensible even by those whose knowledge of organic chemistry is elementary. The significance of particular amino acids in metabolism and in growth is very clearly brought out. Typographically, the work is as well made as are most books of

the sort. There is practically no work of similar scope which would be found more satisfactory to the general reader, who desires to come abreast of current conceptions concerning protein metabolism.

Peroral Endoscopy and Laryngeal Surgery. By CHEVALIER JACKSON, M.D., Professor of Laryngology, University of Pittsburgh; Consulting Laryngologist, Bronchoscopist, Esophagoscopist and Gastroscopist, Western Pennsylvania Hospital; Laryngologist, Presbyterian Hospital. First edition—quarto volume of 705 pages, 490 illustrations and six colored plates. St. Louis: The Laryngoscope Co. 1915.

This book is essential for the study and practice of modern endoscopy of the respiratory tract and the esophagus. The author is the highest authority on the subject, and a master of technique and detail. Much in the development of the art is the result of his genius, which includes a judicious adoption and generous acknowledgment of the work of others. The book reveals a series of possibilities which few have appreciated and which can be reached only by a well maintained equipment and careful training. The author shows that endoscopy has become a specialty in itself, requiring not only complete and well maintained apparatus, but a highly specialized technique. His standard is high throughout. No one, he says, should attempt to remove a foreign body from a human being until he has a hundred times removed a foreign body from a dog. He limits anesthetics, both local and general, to their minimum, believing that their convenience is outweighed by their danger. He rightly says that no one is justified in giving anesthetics to overcome lack of skill. It would, however, be a justifiable opinion that with other operators, the patient would be safer with more anesthesia. The same might be said of other questions, such as exploratory bronchoscopy. The book is comprehensive and thorough. It seems dogmatic at times, and necessarily contains statements that will be challenged by other operators. But the author has in the past been able to prove assertions that seemed at first impossible. His experience, while it has helped him to find or to make an instrument for a great variety of conditions, has not increased the number of tubes, in fact it has diminished since his original set, and he has been a little shy of the large calibre in esophagoscopes. The chapter on Suspension Laryngoscopy was written especially for the book by Killian, a graceful tribute as well as an interesting addition.

The book is not only an exposition of endoscopy, but also a text-book of the surgical diseases of the trachea and bronchi, the diseases of the esophagus, and of laryngeal surgery. The illustrations are numerous, original and to the point.

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MASSACHUSETTS MEDICAL SOCIETY MEETING.

THE one hundred and thirty-fifth annual sessions of the Massachusetts Medical Society and its sections were held in Boston on Tuesday and Wednesday of last week, June 6 and 7, in accordance with the program printed in the issue of the JOURNAL for June 1. There was a large and interested attendance of members at the clinics, at the section meetings, and at the annual meeting. On the evening of June 6, Dr. Theodore C. Janeway of Baltimore delivered the Shattuck Lecture, which will be published in full in the issue of the JOURNAL for June 29. The annual discourse, which was delivered by Dr. David L. Edsall of Boston at the annual meeting on June 7, on "Movements in Medicine," will be published in the issue of the JOURNAL for June 22. Reports of the Council

meeting and of the annual meeting will appear in early issues of the JOURNAL.

At the annual meeting, on June 7, the following officers of the Society were elected for the ensuing year: President, Dr. Samuel B. Woodward of Worcester; vice-president, Dr. F. W. Taylor of Cambridge; secretary, Dr. Walter L. Burrage of Boston; treasurer, Dr. Edward M. Buckingham of Boston; orator, Dr. P. E. Truesdale of Fall River; and librarian, Dr. Edwin H. Brigham of Brookline.

The annual dinner at the Copley-Plaza Hotel on the evening of June 7 was attended by over six hundred members. After introductory remarks by the retiring president, Dr. Charles F. Withington, the principal speakers of the evening were Mr. Channing Cox, speaker of the Massachusetts House of Representatives; Mr. Justice Lawton, of the Massachusetts Superior Court; the Rev. Dr. George A. Gordon, minister of the Old South Church; and Professor William T. Sedgwick, of the Massachusetts Institute of Technology. Mr. Cox spoke with especial emphasis of the importance of the physician's duty in guiding and directing the formation of public opinion with reference to medical legislation and in assisting legislators, by opinion and example, to frame and enact wise medical statutes for the Commonwealth. Mr. Lawton developed the idea of this responsible duty of the medical profession in the education of public opinion, pointing out and analyzing some of the psychologic distinctions between the temperamentally conservative attitude of the legal profession as contrasted with the experimental, progressive attitude of medicine, always receptive to new truth and prepared to adopt demonstrated advantageous changes in method. From the minister's standpoint, Dr. Gordon complimented the medical profession upon its reverence for fact and its readiness for service. Professor Sedgwick congratulated the physicians and the people of Massachusetts upon the excellence of the public health department of this Commonwealth, in whose reorganization, and in whose work already accomplished the profession at large has borne a helpful and creditable part. Dr. Joseph W. Courtney read a fable on "The Scientific Young Physician," which excited much mirth and interest. At the close of the evening Dr. Withington introduced the president-elect, Dr. Samuel B. Woodward of Worcester, who gracefully complimented the re-

ting president upon his administration, and proposed the latter's health. The close of these exercises completed one of the most successful meetings in the history of the Society.

BREAD AND VITAMINES.

THE recent great impetus given to the study of the so-called food deficiency diseases, has served to explain many previously misunderstood facts, and has extended very widely our conception of the rôle of food-stuffs in nutrition. In connection with the work of the U. S. Public Health Service on pellagra, Voegtlin, Sullivan, and Myers (Pub. Health Rep., Apr. 14, 1916) have reported a study on the food value of bread especially in relation to its vitamine content. Their conclusions and findings are of interest not alone to the physician concerned with pellagra, but also to every person who finds bread in very fact the staff of life.

These authors carried on their researches in the South, chiefly in Spartanburg County, South Carolina, but their results have a much wider range. They find that there has been a marked reduction in the vitamine content of the food of the people in the section studied, during the last twenty years. This reduction is laid to three causes: First in importance is the decrease in quantity of vitamine-rich foods ordinarily used, such as milk, fresh eggs and meat. This is due chiefly to the increased cost. Second is the introduction of highly milled cereal products, both of wheat and corn, in place of the older process articles which contained more of the husk and of the kernel of the grain and were correspondingly richer in vitamins. This difference especially affects the poorer classes, where bread is and always has been the chief article of diet. The third factor is the increased use of baking soda in the preparation of bread since the introduction of the highly milled flours and corn products. Soda is used to help raise the bread and too often is not combined with any acid, as for instance from sour milk. The authors quoted indicate that the alkali seems to destroy the vitamine content of the grain and thus to render the bread even more deficient in vitamins. In many sections they found that soda was added to other articles of food, such as beans, to shorten the time necessary for softening by cooking. Here the result is the same on the

vitamines. This is a point worthy of special notice, and in places where bread is the chief food the physician has a new educational obligation.

In connection with the relation of vitamine-poor bread to pellagra and beri-beri, it is to be noted that Seidell has recently (Pub. Health Rep., Feb. 18, 1916) reported a method for extracting vitamins in concentrated form from brewer's yeast, which is one of the richest available sources of vitamins. By a method analogous to the extraction of alkaloids with hydrous aluminum silicate in colloidal form, he has prepared a concentrated vitamine which gives a full dose for an adult man in the bulk of five grams daily. The method, too, as Seidell points out, is applicable to other crude vitamine sources, and he has used it in particular on potatoes. Here, then, we have new light on the question of the vitamine deficiency diseases from two standpoints, one concerned with causation and the other with cure.

Whatever the ultimate chemical nature of vitamins may prove to be, and even if they are found not to be unit substances, the conception of such a group of accessory food substances has filled a valuable physiological and pathological requirement. The clinician, be he in city or country, specialist or general practitioner, must keep himself posted on this subject and especially remember the importance of his educational efforts just as much in infantile malnutrition, scurvy and obscure conditions of adult malnutrition, as in beri-beri and pellagra.

THE EFFECT OF ETHYL ALCOHOL ON THE TOXICITY OF PHENOL.

THE almost universal acceptance by the general public, and even by the medical profession, that the toxicity and the germicidal power of phenol are reduced by ethyl alcohol, and that the latter is an efficient antidote for the former, does not seem to be borne out by experiment. Experience has already shown that the addition of alcohol to dilute carbolic acid does not prevent its action to produce gangrene. The presence of alcohol acts merely as a diluent. But, on the other hand, in high concentration, it favors the absorption of the phenol and thus rather increases than decreases its toxicity. There is no real chemical action between the two. Indeed,

experimentally, it was found that the administration of alcohol immediately after carbolic acid poisoning, as is done therapeutically, only helped to hasten a fatal termination. Somehow, however, animals previously intoxicated with ethyl alcohol seemed to stand phenol poisoning better, though fatal results in mice supervened about as quickly as otherwise. In the same way the determination* of the germicidal action of phenol and ethyl alcohol, and phenol and glycerine, under the Hygienic Laboratory technic—"The Determination of the Phenol Co-efficient of Some Commercial Disinfectants" (Bulletin No. 82)—showed that by rendering the phenol more solvent the germicidal action was enhanced.

So much legislation in relation to the toxicity and the germicidal action of phenol and alcohol has been enacted under this erroneous principle that, in the light of these experiments, especially carried out with this point in view, they ought to be quickly corrected; and the public and the profession ought to be warned of the danger of relying upon the antidotal action of alcohol.

IMPORTANT STUDIES IN METABOLISM.

THE attention of readers is called to the two leading articles in this issue of the JOURNAL, the first by Dr. Benedict on "Respiratory Exchange," the second by Dr. Means on "Basal Metabolism,"—both presenting different aspects of the fundamental problem of metabolism, which has come so notably under the attention of clinical and experimental scientists in medicine during the past decade.

These two papers illustrate particularly the fact that the subject of metabolism, which at first was regarded chiefly from its laboratory side, has also a definite place in clinical medicine. The importance of Dr. Benedict's work on respiratory exchange is well recognized, though not as familiar as it should be to general practitioners. Dr. Means has been working for two years in the field of basal metabolism, and his previous reports have appeared in more purely technical journals. Both his present paper and that of Dr. Benedict are intended to present the facts developed by these years of research in a form to make them available for the use and benefit of clinical practitioners. The facts

of value in connection with the study of metabolism are such as to make their knowledge essential, not merely to laboratory scientists but to those concerned in the actual daily treatment of the sick.

MEDICAL NOTES.

SLIGHT INCREASE IN NEW YORK DEATH-RATE.—According to a bulletin issued by the Department of Health, the death-rate last week was a trifle higher than the rate during the corresponding week of last year, the increase being due principally to an increase in the mortality of heart disease, nephritis and cancer, although bronchitis and diarrhea also contributed to it. The mortality of practically all the other diseases was lower during the past week, and thus offset, to a considerable degree, the increased mortality of the first group. The largest decreases were in the mortality of the contagious diseases and of broncho-pneumonia. The total deaths reported during the week were 1473, as compared with 1430 reported during the corresponding week of last year. The increase in the population accounts for all but eight deaths, the rates being 13.75 for the last week, and 13.68 for the week ending June 5, 1915. In the Boroughs of Brooklyn and Queens, the rate was lower during the past week than during the corresponding week of last year, whereas the rates in the other boroughs were higher. Correcting the borough rates, however, by referring all deaths to the borough where the deceased lived, makes the rate lower in Queens and Richmond, and higher in the other three boroughs. The death rate for the first twenty-three weeks of 1916 is 15.13, as compared with 15.34 for the corresponding period of last year.

AUXILIARY CLINICS FOR THE EXAMINATION OF PEDDLERS ESTABLISHED.—The occupational clinic of the Bureau of Preventable Diseases, New York City, has recently established an auxiliary clinic at a store situated in Manhattan, and another in Brooklyn, where peddlers, applying for licenses, are submitted to a medical inspection very similar to that which obtains at the Federal Quarantine Station. In this way the work of the division has been made a part of the office routine of the Bureau of Licenses, doing away with a considerable amount of hardship for the thousands of peddlers of all descriptions who apply for licenses, and effecting a great economy both in time and energy. At the same time, special examinations of industrial groups and food handlers can be carried on at the occupational clinic without the confusion and interruptions that were inevitable when large numbers of peddlers invaded the clinic.

The physicians assigned to work in these new offices established by the Bureau of Licenses

* Martin, L. Wilbert: United States Public Health Report, April 23, 1916, pp. 1946-54.

select those individuals who present any indication of marked malnutrition, skin eruption, or other condition which may excite suspicion as to the presence of tuberculosis, syphilis, other infections or venereal disease, and refer them to the occupational clinic, where they are submitted to a thorough physical examination, and where proper laboratory tests can be made, if necessary.

THE PREVENTION OF MENTAL DEFICIENCY DUE TO ALCOHOL AND SYPHILIS.—In a paper read before the recent conference on charities and correction, held in New York on May 25th, Dr. B. Sachs, while deprecating the tendency to blame parental alcoholism and syphilis for the greatest portion of mental defectives, expressed the firm belief that such factors were operative in at least a third of the cases. This group, therefore, represents that portion of the total which sanitary measures are best calculated to reach. It is to be hoped that the noticeable awakening of the world to the evils of even moderate indulgence in alcohol will prove an effective means of reducing our present large proportion of mental defectives.

In regard to syphilis, Dr. Sachs urged that hospital and other institutional authorities provide the special accommodation and treatment so badly needed by sufferers from this disease.

APPROPRIATION FOR BOSTON QUARANTINE STATION.—Report from Washington on June 5 states that an amendment has been offered to the Sundry Civil Bill now pending before the National Congress, providing for an appropriation of \$150,000 to pay the City of Boston for its quarantine station equipment which was turned over to the United States Government on July 1, 1915, as noted in issues of the *JOURNAL* prior to that time. It was understood at the time that the national government should pay for Gallop's Island and the equipment of the quarantine station upon it, but no appropriation for that purpose has hitherto been made.

APPLICATION OF THE HARRISON DRUG LAW.—Report from Washington, D. C., on June 5, states that the United States Supreme Court has recently rendered a decision interpreting a disputed section of the Harrison Drug Law. This interpretation is to the effect that the provisions of the law apply only to those who dispense, prescribe or sell narcotic drugs and not to those who use such drugs themselves. If this decision stands, it would indicate that drug habitués cannot be prosecuted under the law for having the drug in their possession.

SUCCESSOR TO DR. EHRLICH.—It is announced that Professor August von Wassermann, chief of the Royal Institute for Infectious Diseases, in Berlin, has been appointed to succeed the late Professor Paul Ehrlich as director of the Institute for Experimental Therapy at Frankfurt.

UNION OF TWO MEDICAL COLLEGES.—At a meeting of the alumni of the Jefferson Medical College in Philadelphia on June 2, the announcement was made of the final union between the Pennsylvania and the Medico-Chirurgical College of Philadelphia. The Jefferson Medical College is to retain its identity, but will become essentially the undergraduate medical department of the University of Pennsylvania. The Medico-Chirurgical College will become a graduate school in medicine.

AMERICAN HOSPITAL AT PANAMA.—Report from Panama states that the new buildings of the American Hospital at Colon have been completed and transferred to the United States authorities. The hospital has an unbroken sea frontage facing the prevalent wind. "Four buildings of reinforced concrete with tile roofs arranged on the pavilion plan, with an administration building in the middle, comprise the new plant. The facilities include an emergency ward, a laboratory, x-ray room, dark room and all other conveniences of a well-equipped modern hospital. The buildings are thoroughly screened and have amply protected verandas the length of the buildings, also an inclosed sun porch at one end."

PREVALENCE OF MENINGITIS, POLIOMYELITIS, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for May 26 states that during the month of April, 1916, there were thirteen cases of cerebrospinal meningitis in Massachusetts, eleven in Maryland, and six in Wisconsin. There were five cases of poliomyelitis in Louisiana. In Minnesota there were 140 cases of smallpox and 62 of typhoid fever. There were 139 cases of smallpox in Wisconsin and 145 in Louisiana. There were 78 cases of typhoid each in Maryland and Wisconsin. The weekly report of the United States Public Health Service for June 2 further states that during the month of April, 1916, there were 6543 cases of malaria in Mississippi, 19 of meningitis in Ohio, 766 of pellagra and 15 of poliomyelitis in Mississippi, 211 of smallpox in Ohio and 170 of typhoid fever each in Ohio and Mississippi.

PREVALENCE OF TYPHOID FEVER IN THE UNITED STATES.—The *Journal of the American Medical Association* has recently published its annual survey of typhoid fever mortality in the fifty-seven cities of the United States having a population of 100,000 or over. In 1910 these cities had an annual typhoid death rate of 19.59 per hundred thousand population. In 1913 the rate was 12.77 and in 1915 it was 8.65. The lowest rate in 1915 was 1.8 in Cambridge, Mass., and the highest 35.1 in Nashville, Tenn. In 1914 the Nashville rate was 47.3. During the past year the typhoid mortality in Atlanta has fallen from 38.9 to 11.1. Besides Cambridge, the

only cities showing a typhoid death rate of less than 5 per 100,000 are Newark, Seattle, Milwaukee and Omaha. During 1915 the typhoid death rate increased in 14 of the 57 cities, most notably in Pittsburg, Pa., Dayton, Ohio, Lowell and New Bedford, Mass. The typhoid death rate of New Haven, Conn. is 18.3.

EUROPEAN WAR NOTES.

MENINGITIS AMONG BRITISH TROOPS.—In last week's issue of the *JOURNAL* we noted the prevalence of meningitis among the British troops last winter. The local government board has recently issued a report of the meningitis epidemic among British and Canadian troops in Salisbury in 1914.

"In his preliminary memorandum, Dr. Arthur Newsholme, medical officer of this board, says that during the years 1913 and 1914 cerebrospinal fever prevailed in this country to a somewhat greater extent than had previously been experienced, and in the first half of the year 1915, this increase assumed large proportions. The number of cases notified were: In 1913, 305; in 1914, 315, and in 1915 the number of cases in the civil population had increased to 2565. This increase coincided with the military mobilization of a large part of the male population. Dr. R. Bruce Low, writing on the prevalence and distribution of the disease during recent years, says:

"Although the disease was present in England and Wales during 1914 and before that time, there is suggestion of a fresh strain of infection having been brought from Canada at the end of 1914 to this country by the first Canadian contingent which came to Salisbury Plain to undergo their final military training. It appears that cases had occurred among the Canadians in their camp at Valcartier before embarkation, and that other attacks among them were reported during the voyage to this country and just after their arrival. About twenty-nine cases had been observed among the Canadian troops up to the middle of February, and twenty-five of them proved fatal. The predisposition to the infection may perhaps have been increased by the unavoidable overcrowding in camp which at first took place, as also by the occurrence of cold, wet and inclement weather, and by the unusual exertion and fatigue incidental to the military training of young recruits."

"In a paper published by Dr. R. J. Reece, one of the Board's assistant medical officers, in the *Journal of the Royal Army Medical Corps*, it appears that no fewer than 2290 cases were notified in the civil population from January to July, 1915, and 1088 among the military, a total of 3378 cases in seven months. Among the different commands the largest number of cases occurred in the Southern District, where 300 attacks were reported, including cases among the Canadian contingent on Salisbury Plain. The

Eastern Command came next with 244 cases, followed by Aldershot with 200 during the seven months. The smallest number of military cases, viz., thirty-two, occurred in the Western Command."

ARRIVAL OF HARVARD UNIT.—Report from London states that the third Harvard unit, which sailed from New York on May 20 aboard the *Andania*, reached Falmouth, England, on May 30, on its way to a British base hospital in France.

BRITISH MEDICAL ASSOCIATION.—It is announced that, on account of the war, the annual meeting of the British Medical Association, which was to have been held at Cambridge, England, will be indefinitely postponed. The statutory general meeting will be held in London on July 28. Dr. Sir T. Clifford Allbutt, Regius Professor of Physics at Cambridge University, has been nominated as president of the Association for the ensuing year.

WAR RELIEF FUNDS.—On June 10, the totals of the principal New England relief funds for the European War reached the following amounts:

Allied Fund	\$116,517.67
Serbian Fund	100,034.22
French Wounded Fund.....	86,607.86
Army Huts Fund.....	56,067.60
French Orphanage Fund.....	53,125.83
Armenian Fund	46,789.19
Polish Fund	36,781.21
Surgical Dressings Fund.....	35,115.67
Belgian Tobacco Fund.....	26,487.65
Facial Hospital Fund.....	21,251.25
Italian Fund	18,672.56
Artificial Limb Fund.....	9,017.00

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending June 10, 1916, there were 202 deaths reported, with a rate of 13.85 per 1,000 population, as compared with 236 and a rate of 16.44 for the corresponding week of last year. There were 40 deaths under 1 year, as compared with 33 last year, and 61 deaths over 60 years of age, against 65 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 58; scarlatina, 30; measles, 299; whooping cough, 33; typhoid fever, 0; tuberculosis, 47.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlatina, 5; measles, 4; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria, 1; scarlatina, 1; measles, 5.

Included in the above were the following deaths of non-residents: Diphtheria, 1.

CARNEY HOSPITAL HOUSE OFFICERS' ASSOCIATION.—The house officers of the Carney Hospital have formed an association for the discussion of medical and surgical subjects. M. E. Barron, M.D., is the president, and J. J. McCaffrey, M.D., is the secretary. On May 24, 1916, Dr. H. O. Marcy, Ex-president of the American Medical Association, addressed the Association, together with the visiting staff, nurses and the sisters. Dr. Marcy delivered an interesting address on "Animal Ligatures."

DEATH FROM ANTHRAX AT WOBURN.—There has recently been reported the fourth of a series of deaths from anthrax among the residents of Winchester and Woburn, Mass. This latest case, a tannery employee at Winchester, died of the disease at the Massachusetts General Hospital.

BERI-BERI ABOARD A BOSTON SCHOONER.—An epidemic of beri-beri occurred lately among the crew of the Boston schooner, *Florence Thurlow*, recently arrived at this port after an eighty-day voyage from Accra, on the African Gold Coast. The first mate of the crew became ill after about a fortnight at sea, and before the conclusion of the voyage, the second mate, the engineer, the boatswain and an able seaman were also ill. The captain diagnosed their cases as beri-beri and his diagnosis was confirmed on arrival at Boston.

BOSTON UNIVERSITY SCHOOL OF MEDICINE.—The annual meeting of the Alumni Association of the Boston University School of Medicine was held in this city on June 6. The principal address was by the retiring president, Dr. H. G. Batchelder. The following officers were elected for the ensuing year: President, Dr. John H. Bennett; first vice-president, Dr. Reuben T. Eaton; second vice-president, Dr. Wesley T. Lee; secretary, Dr. Harold L. Babcock; treasurer, Dr. Howard Moore; auditor, Dr. Nathaniel R. Perkins; directors, Dr. Hollis G. Batchelder, Dr. Percy G. Browne, Dr. Edwin R. Lewis, Dr. Elizabeth Ross, Dr. Conrad Smith; for the advisory committee, Dr. Herbert D. Boyd.

BALTIMORE MEDICAL ALUMNI MEETING.—The annual meeting of the New England Alumni Association of the Maryland School of Medicine, the Baltimore Medical College and the Baltimore College of Physicians and Surgeons was held in this city on June 6. The principal addresses were by Dr. H. H. Sumner and by Dr. A. Lawrence Miner, the retiring president. The following officers were elected for the ensuing year: President, Dr. William T. Councilman; vice-president, Dr. W. E. Lawrence; secretary, Dr. Charles S. Gilman; treasurer, Dr. A. K. Yoosuf; vice-presidents for states, Maine, Dr. L. E. Willard; New Hampshire, Dr. Samuel Miller; Vermont, Dr. L. A. Russlow; Massachusetts, Dr.

Richard Morris; Rhode Island, Dr. W. C. Gordon; Connecticut, Dr. F. M. Dunn.

REPORT ON INSANITY IN 1854.—The May number of the bulletin of the Massachusetts State Board of Insanity quotes from a report made to the Legislature in 1854 on "Insanity and Idiocy in Massachusetts" by the Commission on Lunacy, then consisting of Levi Lincoln, Edward Jarvis and Increase Sumner. This report is well worth careful study and consideration:

"After making a careful survey, they determined that 'there were, in the autumn of 1854, in the State of Massachusetts, 2,632 lunatics and 1,087 idiots, making a total of 3,719 of these persons who need the care and protection of their friends or of the public for their support, restoration and recovery.' Of the lunatics, 1,522 were paupers; 625 were foreigners. Of the idiots, only 44 were foreigners. Quoting further, the report says: 'As the disordered stomach cannot ordinarily bear the common food that others in health enjoy and digest, but needs some change of diet in order to be restored, so the demented mind is generally troubled by the common ideas and thoughts which are found agreeable when in health, and cannot regain its former tone unless a different set of ideas is presented to it.... It is the unanimous opinion of the American Association of Medical Superintendents of Insane Asylums that not more than 250 patients should be gathered into one institution, and that 200 is a better number. When this matter was discussed there was no dissent as to the maximum, yet those who had the charge of the large hospitals and knew the disadvantages of large numbers thought that a lower number should be adopted. Two hundred and fifty were proposed by Drs. Bell, Chandler, Choate, Walker, Ray, Brown and Gray, Kirkbride, Curwen and Worthington, also by the Commissioners in Lunacy in England. Dr. Butler of Hartford, proposed 200. Dr. Fornerden of Baltimore, proposed 150 to 200.... Besides the increased cost of maintaining and diminished efficiency of a large establishment, there is the strong objection of distance and difficulty of access which must limit the usefulness of large hospitals in the country.... The returns of physicians and others show that in their opinion, of the 2,632 insane persons in Massachusetts, 435 were curable and 2,018 incurable.'"

NEWTON HOSPITAL TRAINING SCHOOL.—The annual commencement exercises of the Newton Hospital Training School were held at Newton, Mass., on June 1. Diplomas were awarded to a class of twenty-seven pupil candidates.

BOSTON FLOATING HOSPITAL.—It is announced that the first cruise of the Boston Floating Hospital this season will be made on June 28. It is intended that the hospital ship shall make two

daily trips as it did last year. The medical staff will be under the direction of Dr. Henry I. Bowditch. The nursing staff will consist of seventy graduate nurses, to whom a course in pediatrics will be given during the summer.

RULES FOR PUBLIC DRINKING CUPS.—The Massachusetts State Department of Health has recently formulated and issued the following new series of rules regulating the use of public drinking cups and common roller towels in this Commonwealth. These rules will go in force on July 1:

"On and after July 1, 1916, it shall be unlawful to provide a common drinking cup—

"(a) In any public park, street or way.

"(b) In any building or premises used as a public institution, hotel, theatre, public hall or public school, or in any part of any factory, market, office building or store of any kind which is open to the general public.

"(c) In any railroad station, railroad car, steam or ferry boat.

"The term 'common drinking cup' as used in these regulations shall be construed to mean any vessel or utensil used for conveying water to the mouth, and available for common use by the public.

"On and after July 1, 1916, it shall be unlawful to provide a common towel—

"(a) In a lavatory used in connection with any public institution, schoolhouse, hotel, restaurant, theatre or public hall, or in any part of any factory, market, office building or store of any kind which is open to the general public.

"(b) In a lavatory used in connection with any railroad station, railroad car, steam or ferry boat.

"The term 'common towel' as used in these regulations shall be considered to mean a roller towel or a towel available for use by more than one person without being washed after such use."

BOSTON CITY HOSPITAL UNIT.—It is announced that the Boston City Hospital has recently organized a base hospital unit, for service in the event of war, under command of Dr. John J. Dowling, superintendent of the hospital. The personnel of the unit is as follows: Drs. Edward H. Nichols, Joshua C. Hubbard, Walter C. Howe, Halsey B. Loder, Arthur R. Kimpton, Irving J. Walker, Robert C. Cochrane, surgical officers; Dr. Allen Greenwood, ophthalmologist; Dr. Calvin B. Faunce, otologist and laryngologist; Dr. Ariel W. George, x-ray; Drs. John J. Thomas, William H. Robey, Jr., senior medical officers; Drs. Francis W. Palfrey, Cadis, Phipps, Albert A. Hornor, W. Richard Ohler, medical officers; Dr. Edgar M. Medlar, bacteriologist; Dr. Leroy U. Gardner, pathologist; Dr. Edmund W. Wil-

son, adjutant; Dr. William F. Dolan, quartermaster. Miss Emma M. Nichols is in charge of the nursing staff.

BOARD OF HEALTH OF FITCHBURG.—The Fitchburg Board of Health, in submitting its twenty-sixth annual report, states that the total number of deaths for the year has been 556, of which 121 represent deaths of infants under one year of age. This increase in the number of infant deaths is caused by the prevalence of scarlet fever, diphtheria and whooping cough. The death rate per 1,000 population was 14.02.

DORCHESTER MEDICAL SOCIETY.—At the recent annual meeting of the Dorchester Medical Society, the following officers were elected for the ensuing year:—President, Dr. Francis X. Corr; vice-president, Dr. John F. Fennessey; secretary-treasurer, Dr. Carlton Allard. The following will serve on the board of directors: Dr. Samuel Crowell, Dr. J. Derbin and Dr. John P. Treanor.

OPEN AIR SCHOOLS EXHIBIT.—Attention is directed to the Open Air Schools Exhibit, prepared by the Boston Association for the Relief and Control of Tuberculosis, and now on view in the Art Gallery of the Boston Public Library. The exhibit consists of ninety photographs of open air schools, of which there are about 800 in the United States, the pictures being collected from different parts of the country. Not all of these photographs are of open air schools for tuberculous children, a large portion of them being for anemic and run-down children, and many for normal healthy children. The exhibit will close on June 24.

Obituary.

GEORGE HORTON TILDEN, M.D.

DR. GEORGE HORTON TILDEN, a former practitioner of Boston, died at Paris, France, May 30, 1916, aged 65 years. He was born at Lowell, Dec. 25, 1850, was a graduate of Harvard College in 1872 and of the Harvard Medical School in 1876. Serving as a house officer at the Massachusetts General Hospital, he practised as a specialist in dermatology and syphilis, and was clinical instructor in these subjects in Harvard from 1888 to 1891, being at the same time physician for diseases of the skin at the Boston City Hospital, and surgeon to the genito-urinary department of the Boston Dispensary. He was a Fellow of the Massachusetts Medical Society from 1875 to 1893, when he resigned and went to Japan. He had lived in Europe for many years.

Miscellany.**CINCINNATI AND TUBERCULOSIS.**

THE city of Cincinnati realized that the tuberculosis death rate was 50% above the average and that it had failed to manifest a tendency to decline. Accordingly, the United States Public Health Service was requested to make a thorough study of the situation and submit a report. To show that something more than mere academic interest obtained, 19,932 workers in 154 factories of the city voluntarily submitted to a physical examination.

The conclusions reached point directly to the close connection between poverty and tuberculosis. The great factor underlying the entire problem was seemingly that of economic conditions. One-sixth of all tuberculosis cases came from cheap lodging houses. Alcoholism was a prominent cause, and often accelerated the course of the disease. Occupational hazards and bad working conditions were apparently responsible for about 20% of the cases, but in the majority of instances these hazards were not necessarily inherent in the occupation. Previous tuberculosis in the family occurred in practically a third of all the cases investigated. Dissipation, overcrowding, bad housing, and innate lack of personal responsibility, were also listed as causes.

An interesting feature of the report, and one which has not previously been dwelt upon in studies of this character, relates to the effect of immigration and the rate of growth of the population of a city upon the tuberculosis death rate. It is shown that cities with a population composed largely of racial stock having a limited resistance to tuberculosis are subject to a high mortality rate from that disease, while centers having a slow rate of population increase are likewise subject to a high tuberculosis rate. The evidence is submitted in a comparative table covering sixteen American cities. Almost without exception those with a high percentage of Irish, Scandinavian and German stock, and those in which the negro population is relatively large, have a correspondingly high mortality, while those where the Italian and Jewish element is proportionately great have a low tuberculosis death rate. Similarly, such cities as Detroit and Cleveland, with high rates of population increase, show a low tuberculosis mortality, while Cincinnati and Baltimore, with a relatively small population increase, have a high tuberculosis rate. Doubtless the true explanation of this discrepancy is that advanced by the authors, namely, that where the population increase is rapid, new buildings are erected to take the place of old insanitary structures, and better housing conditions prevail.

THYMOL FROM HORSEMINT.

THAT the commercial production in this country of thymol from horsemint may be, under favorable circumstances, a profitable undertaking, is indicated by the recent investigations of the United States Department of Agriculture, the results of which are published in Bulletin 372. Thymol is extensively used in medicine and forms the basis of a number of important pharmaceutical compounds. In the past it has been imported from Northern Europe, where it is manufactured from ajowan seed grown in Northern India. Now that the European War has reduced these importations from over 18,000 pounds in 1914 to a little more than 2,000 in 1915, it is believed that to some extent the demand can be supplied at home. For several years the Department of Agriculture has been conducting experiments with horsemint, which occurs as a common weed in many localities. These experiments have resulted in improving the plants by selection to a point which, it is said, warrants the use of horsemint for the commercial production of thymol.

Horsemint is found wild on light, sandy soils over the entire region from Southern New York to Florida and westward to Wisconsin, Kansas and Texas. It is probable that it will thrive under cultivation wherever it is found growing wild, but local economic conditions must be considered in determining whether or not its production would be profitable. The investigations of the Department of Agriculture indicate that by distilling the improved plants an average of 20 pounds of oil per acre may be obtained from first-year plantings, and that in succeeding years the yields should be at least 30 pounds per acre. The phenol content of this oil may be assumed to be about 70%, almost all of which is thymol. The yield of thymol per acre of horsemint, therefore, should be for the first year a little less than 13 pounds, and for succeeding years a little less than 20 pounds. As the average price of thymol for a number of years has been about \$2 a pound, the gross returns per acre from a horsemint plantation are estimated in the bulletin already mentioned, at about \$25.72 for the first year, and \$38.58 for each succeeding year.

It is more difficult to estimate with accuracy the cost of producing the thymol. In the opinion of the investigators it is doubtful whether the profits from the industry will be sufficient to warrant anyone in engaging in it unless the horsemint is grown in connection with other oil-yielding plants for which a distilling apparatus is required. In that event, of course, the entire cost of the distilling plant cannot be charged against the thymol industry alone. For this reason, in the estimates of cost of production published in Bulletin 372, such items as land rent, taxes, depreciation, upkeep, and interest on the distilling plant have not been included. Excluding these items it is believed that thymol

can be produced at an approximate cost of \$23 per acre the first year, and \$19 per acre thereafter. This figure includes the growing of the plants, fertilizer, cultivation, harvesting, and distilling. A plantation of horsemint will not have to be replanted oftener than once in five years, and under average conditions may continue to give a good yield for a still longer time. After the first year a material reduction can be made in the cost of fertilizers if the distilled herb is returned to the soil. These facts account for the reduction in the cost of production after the first year.

Correspondence.

THE SINKING OF THE *SUSSEX*.

From Our Special Correspondent Abroad.

MILITARY HOSPITAL, ———, ENGLAND.

April 17, 1916.

Mr. Editor: Having passed through some of the experiences of a wounded Tommy since March 24, I am writing you today with a new point of view. I was on board the *Sussex* on that date, bound for a Red Cross hospital in France. When a torpedo struck us, I was fortunate enough to come off with only a fractured tibia, though many standing near did not fare so well. Some were killed outright and others died before help reached us. Fortunately the ship floated.

About midnight, after nine hours of waiting, a British destroyer came alongside to take off the wounded. I happened to be the first to go over the side. A flexible stretcher was sent on board. It was made of strips of bamboo laid lengthwise and covered with canvas. They rolled me in it like a big papoose, ropes were wound around me, two loops passed over a hook and I was pulled aloft to swing for a moment from the davits.

Below, I could just make out a group of figures on the dark deck of the destroyer, for every light had been extinguished. Then I was lowered to the destroyer and sailors gently untied the fastenings. There was trouble with the knots and one of the group shouted up to the officer on the deck of the *Sussex*, "Sir, let some 'un do the next lad as can tie a knot." The answer came back, "You never mind. I done that job myself." Still in the stretcher, they bore me along the dark deck past shadows I thought were guns, along a narrow passage and down a ladder into a brightly lighted room. Here a couple of men helped me into the chief engineer's bunk, and strapped me in lest the ship should roll. There was a young medical officer on board who attended the more serious cases. He was what is called in the Navy a surgeon's probationer and was, as I learned later, a third year medical student from Glasgow.

About five in the morning I was carried on deck. We were evidently in a harbor, but the only lights came from a hospital ship alongside. She had a row of green lights from bow to stern, which seemed to steam in the morning mist. Above shone a cross of red and white lights. I passed over the gang-plank on the shoulders of four stretcher bearers, through a double line of orderlies, down into the ship's kitchen and through the buffet window into a ward prepared for perhaps 30 patients. The beds were arranged with heads toward the stern. The frames were fastened to the floor and the springs suspended so as to

swing like hammocks when the ship rolled. Medical officers moved from bed to bed examining the wounded as they were brought in. Nurses, or sisters as they are called in the army, hurried about, dressed in gray uniforms and red capes, with white caps which fluttered out behind them. An hour after our arrival every patient had been attended, one man had been borne off for amputation, the medical officers and extra nurses had disappeared, and two sisters remained in charge. Everything had been done with surprising quickness and precision. I looked about the room. It seemed somehow familiar, and a nurse, passing, explained that this was a sister ship to the *Sussex*, which had been changed into a hospital after the commencement of the war. The ward had not long before been the ship's dining-room. An orderly brought in some bovril and bread and milk.

That afternoon we were loaded on to ambulance which came down to the pier. I lay beside George Crocker, a Harvard undergraduate, who had been on his way to a French Red Cross. He was quite unconscious from concussion of the brain, and his knee was dislocated as well. The ambulance jolted fearfully (it was a Ford) and an orderly had to hold Crocker to prevent his being shaken from the stretcher. I thought of the Ford ambulances that are said to have done such splendid work in the Vosges Mountains, and wondered how the passengers fared.

An order had come down from the War Office that we were to be taken into the Military Hospital, in spite of the fact that they were civilians and, for the most part, aliens. The local civilian hospital seems to have been full. We were lifted through the window of a low, brick hut, into a ward where rows of neat white beds awaited us. The former occupants had that morning been rushed off to a convalescent home so as to make room. Our clothes were taken, searched, and put away, and, after baths, we were soon in bed. A number of the patients were suffering from shock more than anything else, and these slept most of the time for several days. After that they left the hospital one by one until now only Crocker and I remain.

The beds have been filled with soldiers, some from "overseas," but most from the troops training about here. Many of the latter are Derby recruits who have been sent in for operations such as hernia or with sprained ankles, etc. These Derby men are a more heterogeneous assortment than their predecessors. Gentlemen of the better classes are being made into privates as well as officers, and in many cases privates of some experience are being trained as officers even though they drop their h's. On my left lies a man, a butcher by trade, who talks such thick cockney one can hardly understand him. On my right lies a banker who is evidently well educated. He has told me of marching and drilling which left his long-unused muscles stiff and sore, of nights spent on the barrack floors, and of rough meals with men entirely ungenial. The time for consideration of the individual's feelings is past; England at last understands what the war has brought.

Tommy's day at the hospital begins at five in the morning, when he is washed and has his bed made by the night orderly and nurse. His first voluntary act is to borrow a match from a "mate" and light his cigarette. The day orderlies come on duty at 6 o'clock, and at 7.30 breakfast is brought from the cook-house, in great pails. If some of the patients are able to be up, they toast enough bread for the ward before the open-hearth fire. There is no means of heating except this. As far as possible, each man is held responsible for the care of his own plate, bowl, knife, fork and spoon. After breakfast comes a great scrubbing and sweeping, followed by tea in the middle of the morning. The medical officer makes rounds and the dressings are done. At noon comes a dinner which, although it may be neither daintily prepared nor even hot, is yet sufficient in amount. During the meal an orderly officer enters and demands, in a loud

voice, if there are any complaints. The ward orderly, speaking for everyone, replies, "No, sir."

In the afternoon, if it is "movie day," the convalescents don their blue woolen suits and red ties, and go off to the "pictures" in charge of a non-commissioned officer. Here they will be admitted free, shown to the best seats and served with tea and biscuits during the performance. On visiting afternoons, poor Tommy is talked to by good ladies who, no doubt, wish to cheer him up but often succeed in making him very uncomfortable. Afternoon tea is served in the ward and any soldier who has denied himself an egg at breakfast may have one then.

The orderly medical officer makes a hurried round before bed-time and, after a cup of soup, Tommy goes to sleep at 8 o'clock— if he can.

The regular army nurses are required in many cases to serve on hospital ship, hospital train and at base hospital in rotation. They are assisted now by Voluntary Aid Detachment nurses, or V. A. D.'s, girls of little or no previous training who are under the supervision of St. John's Ambulance. As far as possible, these V. A. D.'s are replacing the orderlies who are being sent overseas to do the heavier hospital work there.

Sincerely yours,

W. G. P.

AN EXPERIENCE UNDER ETHER.

MILTON, MASS., May 18, 1916.

Mr. Editor: On my rounds the other day one of my patients, now a young woman in the early twenties, handed me the enclosed manuscript which she had written as a composite of several experiences with ether anesthesia.

About twelve years ago the late Dr. Maurice H. Richardson operated upon her for chronic appendicitis, and I could not but regret that he did not know of this fantasy that followed his brilliant operation, as I know how responsive he was to such concomitants of his art.

It has been my experience that it is not unusual for patients to dread anesthesia after the first experience, excepting during childbirth, and yet the explanation for that is often somewhat indefinite. It is, therefore, with more than usual interest that I have read this fight in an "Ether Train," and with the thought that others might equally appreciate it, I hand it to you.

Yours very truly,

WALTER A. LANE, M.D.

THE ETHER TRAIN.

The train was rushing along through darkness and roaring noise. Inside, it was stuffy and dim. There was something the matter with every man on board, but like many a queer person each seemed to look on his peculiarity as an advantage.

One man had a tail, which was fastened not only at the conventional place, but also between his shoulders. It looked like the handle of a pitcher. With this individual I began conversation, for I always like to be neighborly.

"Rather close in this train," I remarked. "Had I been asked, I should have said it smelled badly of ether."

"You may object to that," he replied somewhat snappishly, "but I am above such things. I have trained the hairs of my tail through my lungs and nothing can hurt me."

"Ah," said I, impressively, "but if you have a bad appendix, your tail won't help you in the least."

A look of terror convulsed his features.

"Well, here's where I get off to have it out," he yelled.

And with singular abruptness and agility he dove backward through the window.

"Good riddance!" said a voice behind me. "He was bad for the baby."

I addressed myself next to two cigar merchants. They had tongues fastened to their lower front teeth, like the frog I had once dissected, and they kept flipping them out to taste their cigar wrappings.

"It is a new plan," I remarked, "to use ether for fuel. I can't say I like it myself."

"The smell doesn't bother us in the least," they answered, with the same irritating superiority. "Nothing can hurt us because....."

"Your tongue won't help you in the least," I interrupted, "if you have a bad appendix."

With sudden fear they screamed, "Here's where we get off to have them out."

As their heels disappeared through the window, a voice behind me said "Good riddance!"

I thought the same myself, for the place was intolerably stuffy, and getting smaller every minute.

There was a man with huge white lobes to his ears. They were a foot long and had diamond earrings in them.

"Now for him," I thought.

"Doesn't this place strike you as ill ventilated?" I asked.

"If it did," he answered, with an ill-bred sneer, "I would cover my mouth with my ears."

"That won't help you in the least . . ." I began.

But with a fearful grimace, he interrupted, "Here's where I get off to have it out."

His method of exit was different from that of the others. He grew large. The train at the same time shrank, shutting me in. He disappeared on all sides; and the place became blackness that pressed against me like prickly rubber. This lasted a century. Then the train shut up inside me, and I was free.

I opened my eyes on the light of day and the kind face of a nurse. I tried to speak. I tried twice. Then my numbed lips obeyed and formed the words: "Where did I get off to have it out?"

CORRECTION AS TO NAPOLEON'S WOUNDS.

BOSTON, June 9, 1916.

Mr. Editor: In my letter June 1, p. 813, your proof-reader was liberal (to imitate the British love for a pun and for a quaint phrase), to a degree; he should not have added "M.D." to my name.

Some of Napoleon's battle-wounds can now be specified (fuller references being given in my prior letter):

At Toulon: slight wound on head from spent ball (*Æsculape*, 1913, III, 228); from bayonet, above knee (O'Meara, II, 229; de Las Cases, I, part 2, 67).

At Arcola: sundry injuries and perhaps the greatest danger during his life (O'Meara, II, 227; II, 61; I, 199; *Æsculape*, 1913, III, 228, etc.).

At Alexandria: bullet-graze, nearly fatal (Blackwood's, 1912, CXCI, at 501).

At Damanhor, horse-kick, apparently more serious than stated in BOSTON MED. AND SURG. JOURN., April 20, 1916, at 581 (see *Æsculape*, 1913, III, 228).

At Marengo, slight, from cannon-ball (O'Meara, II, 227-9).

At Eckmühl, toe (O'Meara, I, 199).

At Ratisbon, heel (illustrated at *Æsculape*, 1913, III, 228; 1914, IV, 225; etc.).

At Arcis-sur-Aube, where he urged his horse over a smoking shell; after the explosion he emerged "covered with contusions and ecchymoses in great number" (see *Æsculape*, 1913, III, at 230). Similar bruises, etc., he received elsewhere while having eighteen other horses killed under him (as to this see O'Meara, II, 229), during the sixty odd battles in which he took part.

ALFRED ELA.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF
AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN
PROFESSION, FOR THE MONTH OF MAY, 1916.

No contributions for the month of May, 1916.

Previously reported receipts \$7,941.86

Previously reported disbursements:—

1,625 Standard Boxes of Food at \$2.20	\$3,575.00
1,274 Standard Boxes of Food at \$2.30	2,930.20
353 Standard Boxes of Food at \$2.28	804.84

Total Disbursements	\$7,310.04
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Balance	\$631.82
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F. F. SIMPSON, M.D., *Treasurer*,
7048 Jenkins Arcade Bldg.,
Pittsburgh, Pa.

SOCIETY NOTICE.

THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.—The next meeting will be held at the Hotel Brunswick (Room G), at 7.45 p.m., Thursday, June 15.

A paper by Dr. Jay H. Radley of New York, on "Spinal Adjustment," will be read.

Dr. Charles A. Eastman of Amherst, who has done so much to elevate his own race—the Indian—and is now trying to improve the White, will address the Society on, "The Games, Exercises and Remedies of the Indians."

Members of the medical profession are invited. Please be prompt and thus show your appreciation.

DOUGLAS GRAHAM, M.D., *President*,
Hotel Brunswick.
MRS. MABEL F. WALKER, *Secretary*,
115 Cedar Street, Malden, Mass.

APPOINTMENTS.

NEW YORK UNIVERSITY.—Dr. Henry W. Wandless has been appointed clinical professor of ophthalmology at the New York University and at the Bellevue Hospital Medical College.

UNIVERSITY OF CINCINNATI.—Dr. Jesse F. Williams, formerly assistant professor of hygiene at Columbia University, has been appointed professor of hygiene and physical education at the University of Cincinnati.

MARRIAGE.

ELMER S. BAGNALL, M.D., of Roslindale, Mass., to Miss AIDA H. SALMON of Rouben, N. J., June 3, 1916.

RECENT DEATHS.

DR. THOMAS FRANKLIN SMITH, who died recently at New York, was born in that city in 1833. He received the degree of M.D. in 1860 from the New York Medical College, and served as a surgeon in the Union Army throughout the Civil War. He was a charter member of the International Homeopathic Medical Association, and a member of the New York Homeopathic Medical Society. He was a member and for 23 years treasurer of the American Institute of Homeopathy. For many years he was manager of the New York Association for Improving the Condition of

the Poor. He is survived by his widow, three daughters, and two sons.

DR. ALFRED HUGH McCORMICK died at his home in Northampton, Mass., October 28, 1915, aged 44. He was a graduate of Trinity College, Ontario, in 1900, and settled in Northampton and joined the Massachusetts Medical Society in that year.

DR. AXEL FRIDOLF SWANSON of Cummington, died at Easthampton March 19, 1916, aged 35 years. He was a graduate of the Albany Medical College and joined the Massachusetts Medical Society in 1913.

DR. NATHAN JENKS, who died recently at Detroit, Mich., was a member of the American Association of Obstetricians and Gynecologists, and a Fellow of the American College of Surgeons. He is survived by his widow and by one daughter.

DR. ALBERT CURTIS PERVEIL, who died recently at Brooklyn, N. Y., was born in Hackensack, N. J., in 1874. After receiving the degree of M.D., from New York University Medical College, he became ship's surgeon for a time on a trans-Atlantic liner. Later he settled in Africa and practised his profession there for two years. After a brief return to the United States, he again went to Congo, where he became infected with trypanosomiasis, from which he finally died.

DR. ALFRED KING, who died of pneumonia on June 4, at Portland, Me., was born in 1861. He graduated from Colby College in 1883. For many years he had been a teacher in the Maine Medical School, where he was professor of surgery at the time of his death. He was a member of numerous national and local medical societies.

DR. JAMES TURNER SHERMAN, who died of pneumonia on June 6 at Dorchester, Mass., was born in Newport, R. I., in 1849. He graduated from the New York Homeopathic Medical College in 1869 and soon settled at Dorchester in the practice of his profession. He was a member of the Massachusetts Homeopathic Medical Society and the Massachusetts Surgical and Gynecological Society. He is survived by his widow and by two daughters.

DR. ABNER HOWARD POWERS, who died in Boston on May 13, was born in 1856. He received the degree of M.D. from Boston University in 1885. He was professor of surgery at Boston University and surgeon to the Massachusetts Homeopathic Hospital. He was a member of the American Institute of Homeopathy, the Massachusetts and Boston Homeopathic Medical Societies, and the Massachusetts Surgical and Gynecological Societies.

DR. NORMAN GREENE REOCH, who died recently in Winthrop, Mass., was born at Phoenix, R. I., in 1880. After studying at the Harvard Dental School, he began the study of his profession in Boston in 1893. He was for several years instructor in orthodontia in the Harvard Medical School and at the Forsyth Infirmary. He is survived by his widow.

The Boston Medical and Surgical Journal

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Massachusetts Medical Society.

THE ANNUAL DISCOURSE.

NOTE.—At an adjourned meeting of The Massachusetts Medical Society held Oct. 3, 1860, it was

Resolved, "That The Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

MOVEMENTS IN MEDICINE.*

By DAVID L. EDSALL, M.D., BOSTON.

THE past two or three decades have been more important in certain ways to the medical profession than has any other similar period. There have been times when more deeply fundamental work was done in medical science than any which has come forth in this period, but there has been no time when there has been built, upon foundations already laid, a structure of such large importance and such sound value to the general public. Developing upon principles established before this time, and elaborated from them, there have been contributed a most remarkable number of facts, in many instances of very great individual importance. But, large as their individual value has been, it has been less significant than their influence as a whole, for this has been such as to alter the relations of the profession to the public at

large in a way that is extremely noteworthy. I mean, obviously, first of all that the developments have been of such character that they have demonstrated as never before was done to all open lay minds, and have emphasized in the medical mind the economic importance of the public health. But, I mean beyond this that these developments have made medicine a much more complex profession, and have added a new and very important character to the calling. It is not simply that the details of progress have made it necessary to acquire more varied and extensive scientific knowledge in order to practise medicine. It is also and even more largely because, far more than was ever true before, they have imposed upon physicians the need of looking upon their profession in its relation to many general economic and social problems of the community as a whole, quite as much as in its relations to the individual sick. These changes have already produced and will produce in increasing numbers, a breed of doctors known earlier only occasionally, and then usually developed by circumstance rather than by design. The times just past and those at hand are likely, in fact, to prove more significant in their influence upon the character of medicine as a calling than any previous time.

The doctor has always been somewhat cloistered from the world of affairs. Untrained in executive and business matters and traditionally unsuccessful in these as a rule, he has been separated by his unsuitable training and by the urgent character of his work from any active part in public affairs. Indeed, he has been excused by law from some public duties

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that other men are obliged to do, and by common tradition has been free of criticism if he took less part in other such matters than do most men. Medicine has, in fact, attracted very largely men who temperamentally shun public activities. Besides this, one of the more or less definitely recognized large compensations in medicine, and one that has been most jealously guarded and perpetuated, is that the doctor owes obedience only to the law and to his own conscience, and is not subject to human masters. As a consequence, he has often avoided and even resented, anything that interfered with his freedom of action, and this, together with the fact that there were few positions of dignity open to medical men in which they were parts of a system or were subordinate to higher authority, has made the general idea of being part of a machine moving in necessary co-ordination with other parts, usually distasteful. Indeed, even a position on salary has been a thing that often suggested that the man holding it was, perhaps, a failure in his chosen career except in a few types of work.

But the developments of recent decades have shown beyond peradventure that the broadest and most beneficent activities of medical men in preventing and eradicating disease have in later times been, and will mostly continue to be, not brilliant individual researches or individual struggles with disease, but organized systems of attack in which everyone, whether in senior or junior positions, will be no longer a free lance, but subordinate to the system, and dependent upon it for his success. In fact, in those activities that now give it its greatest public influence and power for good, medicine is not now an independent profession, but a part of a whole and dependent in accomplishing its aims upon firm executive control, whether this is exercised by a medical man or other. A very large proportion of the men who have won high distinction recently have won it because they have developed both their scientific capacities and their executive powers, and have employed organized rather than individual effort to accomplish their ends. This will be true to a still larger extent in the future, and the attractions of such a career will lead many of the ablest and most powerful minds into such work instead of into practice, and may readily attract into medicine many whose temperaments would earlier have led them into other forms of work.

What I have spoken of applies chiefly to the direct attack upon disease itself. But the character of the medical calling is being everywhere more or less profoundly influenced in another way. There have been among various peoples, especially among those highly cultivated for their periods, times in which very great interest was taken and valuable measures were adopted regarding the general social conditions that are largely responsible for the occurrence of distress and disease in the first in-

stance and that propagate and perpetuate them. These measures were largely confined to individual races or nations, however, and also with changes in the fortunes of the people who originated or developed them, they in large part ceased to be effective, and they had at most an indecisive influence upon the medical profession at large. But we have been, and still are, witnessing a remarkable wave of public interest of world-wide extent in the social causes of distress and disease,—a wave that may well become a steady current, and that has carried away in some of the most important parts of the world certain established medical relations, customs and traditions. What I spoke of earlier you may well say is having an extremely interesting and highly important influence upon medicine as a whole, and upon a limited number of men in the profession who engage in research or enter into national, state, or municipal health services, or who are in other ways in a somewhat separate sphere, but has no immediate and acute bearing upon the life of the vast bulk of the profession who are engaged in practice. What I would refer to now, however, has the most intimate possible bearing upon the relation of most individual physicians to their patients. In dealing with disease it was customary for many years to adopt an attitude almost solely of defense. Even when hygiene became widely established, it had as its main object the control of existing disease, and, chiefly, epidemic disease. It took up the prevention of disease in limited degree only, owing to limited knowledge. In recent times knowledge of the immediate causes of disease, especially of infectious disease, has been so largely added to, that we recognize clearly that the whole matter has assumed an aggressive instead of a defensive aspect, and the great object now is the progressive destruction of diseases through eradication of their causes. A massive and organized attack upon the immediate causes that are most accessible—bacteria and the like—has been well begun. We have long realized that these immediate causes are only part of the story, and that the attack upon them must have but limited success so long as conditions favorable to their activity exist widely. Physicians more than others have appreciated that the manner and conditions of life largely determine the occurrence of disease, and they have been active in philanthropic and other movements that aim at the betterment of these conditions; but none realize better than they the difficulties of improving these conditions in any general and permanent way, and the slight and often transitory character of the results of local and especially of unorganized efforts.

The most brilliant and broad-visioned attack upon this problem—upon the social conditions that start and continue disease—that has come from medical men is one that originated here in the mind of Richard Cabot. I mean, of course,

medical social service. The rapidity and force of its progress over the country within a few years show not only its value, but also that the need has been so great that a workable system of attacking the problem was grasped at at once. But no one sees more clearly than the originator of this excellent plan that it is only partly preventive and chiefly curative. It is a pruning away of growths that have become harmful or are likely to be so, but so long as the roots flourish the outgrowths will occur and recur and frequently increase. A few years ago it sounded almost original to say that inefficiency, improvidence, distress and vice are the greatest of the causes of disease. Now it seems very familiar, but it has seemed a somewhat Utopian dream to consider that there would be anything but gradual improvement in these factors as the world rolled on. Throughout the last thirty years, however, many people have been wondering whether a promising method of influencing these factors rapidly had not been devised, and as experience of results accumulated, the opinion of many persons engaged in medical and social work and in statecraft has been turning more hopefully towards this system.

When Bismarck and William I introduced the bill which carried in it the beginnings of compulsory sickness, invalidism and accident insurance, it was presented as a means of relieving and forestalling distress, but it was recognized to be a means of preventing both the distress that produces disease and the disease that produces distress. It is a very remarkable fact that the beneficent purpose was so clearly put forth that the bill passed without opposition, radical and new as its provisions were. It is similarly remarkable that the principles underlying the action, its bearing upon the control of disease, and its vital importance to the medical profession, not only in relation to the livelihood of the doctor, but in relation to his powers of accomplishing results, have been so little appreciated by the profession in general. Even now that the system has been adopted in extensive form in Great Britain and, at least, suggestions of it in many of the countries of Europe, and it is here at our very doors for discussion, it has had very little attention from medical men in this country, and in so far as it has been discussed it has been in considerable part in a suspicious and defensive spirit. That some antagonism has been shown is not surprising, since medical knowledge of this system has in this country come chiefly through knowledge of the contests that it has excited from medical men in Germany and England. But it is the most important question of legislation bearing upon medical men that has ever come up in its relations to their incomes, in relation to their freedom of action, and in relation to the good that they may do in their work, and as such it must be approached with an intelligent knowledge, and demands study from med-

ical men. Furthermore, it seems highly probable that whatever medical men may or may not wish, it will soon come in this country.

In Germany it has meant that, even previous to 1911, over 14,000,000 of the 64,500,000 of the inhabitants were participants in the sickness insurance and over 15,000,000 in the invalid insurance, and the medical and surgical care of the insured was provided for by the system and not by them as individuals. The new law has increased the participants by about fifty per cent. In regard to accidents, there were already about 24,000,000 participants. A similar proportion of the population is included in England in so far as the system has developed there, and a similar proportion would be included in the legislation proposed in this state and in New York during the past winter, and about to be proposed in other states. Manifestly, this is important to doctors. It is equally manifest that if doctors are not treated with scrupulous fairness such a wholesale control of their work and incomes is bound to do them injustice and perhaps great harm. It was chiefly because of lack of fairness in some instances, in others because, apparently, of a lack of understanding of the effect upon physicians, that contention arose with them abroad. This was partly due to the medical men themselves in that they did little in the matter until prospective or actual financial pressure led them to act. But it had the unfortunate effect of giving a wide-spread impression that medical men were bitterly opposing what, to a great proportion of thoughtful people, seemed profoundly benevolent legislation, on purely mercenary grounds; and when in any disagreement the question under contention is clearly one of emolument, it is very difficult to avoid the impression—whether it is a correct or a wrong one—that the basis of contention is not justice but self-interest. Bitterness at the thought of being under control, and sometimes under unfair control, has largely overshadowed the whole medical consideration of the matter; but it has come to the point with us where this system must be discussed, and, I believe, where it will before long be adopted; and I trust that, warned by previous experience, we shall be able to approach it always with the desire to secure justice for the profession, but equally with the desire to show that we wish justice for others, and with recognition of the fact that the system is capable of being carried out in such a way that it will not only preserve the rights of physicians but also, in some ways, may safeguard them, as compared with present methods, that depend upon the frailties and irresponsibilities of many individual patients.

The financial side of the matter unquestionably needs especial care in this country, not only in its relation to physicians, but in its general aspects, and particularly in justice to the insured, because our political morals are admittedly looser in this country than in Eng-

land or Germany. If adopted, the system means that astonishingly large sums of money will be handled by it, and the opportunities for and temptation to graft and the dangers of financial mismanagement will be very large. But granted that just provisions are made, we need to look upon the matter first of all as the largest social community problem that has appeared, and one in which medical men are peculiarly vitally interested because it so vitally influences their powers of accomplishment. I am quite convinced of the value and wisdom for people of narrow incomes of compulsory insurance, merely from the standpoint of automatically protecting them against times of stress through their own efforts with added aid from employers and the state. From the standpoint of the public health there can be little doubt of its powers for good. To be very brief, let me quote but two remarkable facts: first, that over 100,000,000 persons had been given benefits under the system previous to 1910; and, second, that even before the additional income was provided by the new law, about half a million dollars a day were being spent in Germany through this system, and that, with the numbers of people in this country and with the American scale of wages, this sum would at least be doubled here under similar conditions. These facts show the financial power in the system. In Germany this money has been in large part spent, not only in benefits and other necessary, though more or less temporary, but vastly important things. Much has, in a remarkably broad spirit, been devoted to constructing and maintaining hospitals and other institutions for sick and invalid persons, and to a great variety of other purposes; including, for example, the constructing of, or the lending of money at low interest for the building of, public baths, water and sewer systems, and similar hygienic advances; building houses of hygienic character to rent at moderate cost to working people,—in fact, for the money available above the benefits necessarily paid, all broad uses that would strongly tend to improve health and diminish sickness, have been sought out energetically as peculiarly sound investments because tending to decrease progressively the outlay of the insurance societies by decreasing the need of benefits. One can scarcely contemplate the use of such large sums of money without being convinced that if only reasonably wisely used, an enormous and relatively rapid influence in improving health must result, through eliminating many unhygienic conditions and still more through doing away with the acute distress that sickness and invalidism bring to those affected and to their dependents. So important a problem needs broad and friendly consideration. I believe it can be arranged with entirely dignified relations to the medical profession, and even with actual benefit to the profession. One of the most successful ways of avoiding disagreements is

through not forcing regulations, but agreeing upon them; and the more largely arrangements with medical men are made through friendly understandings rather than as bargains, the more successful they will be. Indeed, I believe that it would greatly help in avoiding contention, and beyond this in establishing in wise form many of the details of the system in which medical advice is highly important, if the local medical men involved had direct representation on the governing bodies of these insurance societies if they come to be formed, just as both employees and employers must be so represented. This has not been done abroad, but it seems to me eminently just, since physicians are, of course, essential to the system, and they are quite as vitally affected by it as anyone. And it is not only just, but would accomplish more efficient results in a variety of ways. It appears to me, at any rate, that this body may well take means to carry out a study of the matter and to determine upon a plan of action, before the need of hastily determined action perhaps arrives precipitately. If it arrives, it will at one step turn a large part of medical practice into part of a great system, instead of a purely individual relation with individual patients.

Many other factors are tending to make medicine more important as a public profession, and relatively less so as a private relation in its main activities and emolument. The decrease in infectious disease that has already occurred has distinctly lessened the total demand for family doctors. Also the state has taken over a very definite share of the actual management of some cases of infectious disease, and will necessarily exercise a gradually increasing control. It will, I am sure, not be many years before an appreciable influence will be exercised upon venereal disease by public action, difficult though this question is and demanding, as it does, cautious and unimpulsive measures in order to avoid doing harm. In the world at large the alcohol question has shown remarkable progress, and to me the time seems clearly ripe in this matter, not for joining prohibition movements or other drastic types of action, but for a frankly aggressive stand on the part of those who see its effects, and especially those who have responsibility for the public health,—a stand that does not need to ally itself with the emotional side of the question, but should rather be definitely educational, and with improved health and efficiency as its objects. When we see what such methods have done for tuberculosis we can scarcely doubt they can do similar things in controlling the effects of alcohol and venereal disease, especially when the changed and increasingly positive attitude of employers and of the public at large toward alcohol, in particular, is considered. With a decided drift toward the control of these enormously important causes of disease, a large effect upon the

sum total of the doctor's individual repair work and upon his purely palliative treatment must be exerted.

I am not one of those who feel that the health millennium is at hand, nor do I comprehend within my vision the time when medical practice will be a matter in which the doctor and the patient—as they have long been known—will no longer exist, and the treatment of disease will be carried out through government bureaus and public institutions. Doctors and patients have too human a relation to make this possible, however efficient it may appear to some persons. But I do see increasing influence of the doctor as a public servant; and with this an increasingly large proportion of the strongest and most important men in medicine will go into other forms of work than ordinary practice, so that the attractions of the newer forms of activities, as well as the influential character of the problems that they deal with, will tend to make them a great power in determining the character of medicine as a calling, whereas, until recently, its character has been determined largely by the practice of the art of medicine. All these movements will lessen the total number of the sick, and probably the number of practising physicians, but need not lessen the influence of the latter in the community. On the contrary, they will tend to increase it, for when wisely taken advantage of, they give physicians, not only their very strong human influence with individuals, but also an influence as public counselors and leaders, that the calling did not until recently carry with it.

The changes in the character of a calling and in its ideals, aspirations and traditions usually come chiefly from two sources: from the pressure of the demands upon it and from the visions that those entering it see. That medicine has greatly changed, not merely in knowledge, but in the demands upon it, we know well. That it has changed in the visions that it carries with it must be very apparent to anyone who has frequent occasion to advise young men, of especially earnest and ambitious type, who are just entering the profession, in regard to what was, not very long ago, a relatively simple matter, namely, as to the character of work that they may wisely take up at once. Twenty-five years ago there were few things to choose from. Few men thought at once of anything but some form of practice—of caring for the sick. With most men then it was a choice of the particular form of practice that most attracted. In fact, in most instances, even specialization in some particular form of practice was a future prospect to be worked up to through early general practice, rather than an immediately necessary choice; and the advice was often flatly given that experience in general practice should precede specialization of any sort. Some men who were hard pressed financially, or who looked merely for a berth that was fairly secure, put aside practice, tempo-

rarily at any rate, and went into institutional work or into the government services, though a small number were keen enough to see real opportunities in the latter. There were at that time relatively so few positions in teaching, and especially in research, available, and particularly so few that could be had very early in one's career and that carried a living with them, that only an occasional man could go directly into such work. Indeed, until recently, even the full-time senior positions in laboratory branches have been in large part filled by men who had earlier been, to some degree, in practice; and had by choice, or sometimes by circumstance, later been led into this work as a career. It was, I think, at that time usually somewhat of a shock to a man who had gone through a medical course, even almost like a confession of failure to measure up to the career that he had planned, to see before him the definite separation of his activities from the care of patients. It was something like the conditions in Dr. Weir Mitchell's youth in regard to research. You may remember that when he told his father, after he got through his hospital work, that he would like to spend several years in research, his father somewhat hotly told him that that would be looked upon by the public very much the same as if he had joined a circus. At present things are vastly different. The great majority of young men, of course, still go into practice, but very often now they make an immediate choice of some particular line of practice. The most striking difference now, however, is that there is no longer a suggestion of shock in considering the choice of some form of work that does not involve private practice. It no longer means a distinct shifting of purpose and detachment of one's self from the real medical career. The great majority of the most alert and most ambitious young men are loath from the first to feel that their work will be limited to practice. Much more frequently than was the case they look forward to doing, at least, some research and teaching as collateral activities. A considerable proportion of them seriously consider whether they will not go definitely into other things than practice, and a noteworthy and constantly increasing number are doing so. There is no reason to think that the proportionate number in the latter group will decrease. On the contrary, there is every reason to think it will increase. This changed viewpoint has been brought about by several main factors. What I have been discussing has had much to do with it. An interestingly large number of young men of the best type are beginning to have yearnings toward direct public service in some form, partly because they frequently feel a conscientious desire, widely growing in many other professions, for such service, but partly because they see the possibilities of fruitful work in these lines. The national services already offer attractive careers. If the tenure of

office and the opportunities provided in state and municipal work were only more frequently adequate, many would go into these lines, and more men of good caliber are greatly needed in them. It is very interesting to see the change in attitude. Such positions now appeal to young men directly as opportunities. We have only slowly realized that they are not chiefly sleeping berths.

The main factor, however, that has changed the viewpoint of young men has been the change in the character of the teaching of medicine, and the increasing complexity of the study and practice of medicine. Important as it has been, the change in the public relations of medicine, the long quick stride ahead in its economic and social relations and dignity, has been of secondary importance. Without the former, these men would not have seen or been prepared for the latter. The placing of the laboratory branches of medical study in this country in their proper positions of dignity and influence has, without doubt, had more effect than anything else in developing both the standards and the visions of the young men in medicine. This movement was begun before the period of which I spoke, but reached a general and satisfactory development only during that period. When these branches were looked upon by the men teaching them as collateral interests, and very often merely as stepping-stones to practice or to clinical chairs, it was natural that they should have relatively little influence. With the recognition of the need of laboratory teaching of laboratory branches by men highly trained in them and devoting themselves to them, came not only the result mainly desired, namely, the opportunity for the prospective practitioner to get sounder fundamental training, but also the opportunity for those whose bent lay that way to learn early the charm for them that there is in hand-to-hand work in those subjects,—a charm that without this intimate contact with them was often never recognized, or was felt only through later chance. The work in course in the laboratory now leads a considerable group to think of life work in these branches; and the comparatively large and constantly increasing number of available senior and junior positions in teaching departments, in hospital laboratories and in other places, that carry a living with them, give opportunity for a noteworthy number of men to take up such work at once. But, besides this, the result of having a group of able and devoted men engaged, not simply in casually teaching fundamental branches, but in spending their whole time in energetically developing knowledge of them, has been that enduring contributions to knowledge have come very largely from men in these branches; and also, men so well trained as to be stimulating and inspiring to young men who are intellectually ambitious, have in such large proportion been developed in these subjects that it has led into them a large share of

that group of young men, always small in number, but always of dominating importance in any profession, those, that is, who are gifted with the desire and the power to contribute to progress. In recent years, men capable of judging have repeatedly said that in the past generation there have been a larger number of men of first-rate mind in the laboratory subjects in this country than in the clinical. Whether or not this statement is correct we do not now need to determine. We may, nevertheless, well reflect upon the fact that conditions are such that it is difficult to disprove it. A point that interests me very much, however, and one that is, I believe, certainly true, is that a large proportion of the very best young men shrink now much more than they did in earlier years from going quickly into practice. Some of the reasons that they give are interesting and need attention. In considerable part it is because they feel that the standards of practice do not meet what they desire; that they are less exacting, less reliable than those of the medical sciences, and they often feel that it is very difficult to avoid taking a step downward in regard to thoroughness and accuracy of effort when they detach themselves from work in the medical sciences and take up practice. Some of them frankly confess that they fear that they must turn away from the standards that they have come to cherish, which demand that the intelligence must be satisfied before accepting anything, and that, instead, they must in practice flounder among impressions and speculations and unproved theories. Much of this is youthful exaggeration, and much of the shrinking from practice is due not to such feelings, but to a natural desire to become better fitted for work that the last few decades have made much more complex than it was. Much of it is due to the fact that indefinitely continued work on problems is more fascinating to many able minds than practice, and as I have already said, the present method of teaching medicine presents it and its problems much more intimately to the student, and makes these problems much more engaging than did the older method. Some of it, a good deal perhaps, is due to the fact that at present students come into contact with patients so much more closely than they did, but see them chiefly in hospital wards, where, like those who are in consulting practice, they meet so large a proportion of persons who, through disease or distress or vice, seem beyond help, that they occasionally become oppressed by it and by what practice seems to mean. They have had little opportunity to experience the cheerful things that practice brings, and have had but a small share of the grateful human side of medicine, that comes in its best and most frequent form in the relation between family physicians and their patients. I have known repeated instances of hospital internes becoming completely shattered emotionally by the strain and discouragement of a prolonged succession of

distressing and hopeless cases, and have known them repeatedly to resign impetuously, and even to quit the profession at once. Nevertheless, when all the factors mentioned are allowed for, it seems to me that the proportion of first-rate men whose feelings are more or less deeply colored with regret when they take up practice is worthy of study when we consider that the great *raison d'être* of the medical profession is still, and will long be, to treat the sick. It would seem to be evidence of some incompleteness in development of our present system, especially when we consider that almost all young men a few years ago looked happily forward to practice at first, and if they became detached from practice, did so only later. There are but few I am sure who believe that the cause of this lies in the greater development of the teaching of the medical sciences. Long before the medical sciences were given so much time and attention as they now are in the curriculum, there were critics, conspicuous among whom were John Brown and Oliver Wendell Holmes, who feared that these subjects were being overdone, to the disadvantage of the clinical. But it is very difficult to believe, so long as the clinical branches are given the large amount of time that they are now, that the better teaching of the fundamentals of medicine is a fault. Paradoxical as it may seem, it would, on the contrary, appear that the line of advance that has perhaps produced this condition must, in a certain sense, be forced further to overcome it.

The trouble does not, I think, lie in the fact that practice involves working so much in things of which we are ignorant. Bolder and more inquiring minds enjoy the unknown. It is rather, I think, that there still exists a chasm between the laboratory and the clinical branches, with only occasional bridges between, and these not very secure. The persistence of this chasm is due partly to imperfect efforts on each side toward its effacement. The divorce of the laboratory men from practice and their alliance in manner of life with pure science, led many of their number for a time, as occurs so often after any important readjustment of principles of life, to a somewhat deliberate and ascetic detachment from the practical. This reached its most marked stage when a group of them advocated that these branches be taught outside the medical school as a part of general university courses, so as to remove any taint of utilitarianism from them, a plan based in part at least upon what may, I think, without injustice, be called a kind of intellectual snobbishness that considers the practical use of science much the same as its prostitution. In recent years there has been a strong opposite current, and co-operation between the laboratory and clinical departments has become the recognized goal. But there is still opportunity to make teaching in the medical sciences more directly illuminative of clinical study, though not simply utilitarian. The chief cause of the sharp division

between the clinical and the laboratory years, however, is, I believe, that observation and speculation are much more dominant methods in the activities of the clinician in both his teaching and his practice, than they need to be. Habits are strong factors, and clearly as we may recognize the relations of the medical sciences to practice, it is extremely easy to fall into the methods that we were taught, and these were chiefly observation and speculation, and I fear that those of us who are clinical teachers and practitioners must bear the chief blame if the keen student feels critical of clinical methods. Furthermore, few clinicians have sufficiently intimate and prolonged training in any of the medical sciences to be able to teach their relations to medicine in any adequate way, and yet they must do it if it is done, for the laboratory men have, as a rule, little or no clinical knowledge nowadays.

This is one of the reasons why, after some consideration, I not only do not feel opposed to the much-discussed plan of having a group of clinical teachers, who practise little or not at all outside hospitals, but, on the contrary, feel it will do good. What I have mentioned regarding the not uncommon attitude of the student and recent graduate, as well as experience of other kinds, lead me to feel that one of the things we most need in training young men is to stop the gap between the laboratory and the clinical years. I think this can best be done by having a group of clinicians so long and continuously engaged in the investigation and study and teaching of clinical problems that they naturally and efficiently bring into play all the relations between the fundamental and the clinical branches. This would undeniably be valuable to the student in his formative years. It would dispel any feeling that practice must be a disappointment to those of scientific temperament, and it would add what the laboratory departments have had to their advantage,—a group of men devoting themselves so completely to the study and development of their branches that they would attract many keen and inquiring minds into clinical work that have tended to go into the laboratory subjects. This again is one of those things that is probably coming in varying extent in various places; that has, in fact, already come in considerable degree, not in one place alone, but in a noteworthy number in a very few years. And, a point that has greatly influenced my feeling as to its probable spread, one finds again, that, in clinical medicine at any rate, a large proportion of the ablest young men not only do not resent the idea, as some older men have, but welcome it heartily. It will, of course, not displace the customary type of clinical teacher. It will simply, like some of the other things I have mentioned, add a new breed that will have its own peculiar function,—a function developed from the progress that medicine has made.

Original Articles.

RESPIRATORY EXCHANGE, WITH A DESCRIPTION OF A RESPIRATION APPARATUS FOR CLINICAL USE.*

BY FRANCIS G. BENEDICT, BOSTON,

AND

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(Continued from page 86.)

PART II.

A CLINICAL RESPIRATION APPARATUS AND ITS USE.

THE clinical respiration apparatus represents the culmination of the research which has been in progress for several years in this laboratory on the development of a suitable apparatus for use with pathological cases. The dog respiration chamber, the infant respiration chamber, and the chamber for small animals, all of which have been previously described², were steps in the development of the larger apparatus.

In devising this apparatus a number of important points had to be taken into consideration from the beginning. In the first place it was necessary to reduce the volume of the chamber to the smallest possible limits consistent with the physical and psychical comfort of the patient. Secondly, since complicated and technical difficult gas analyses are precluded in an apparatus intended for clinical purposes, a method had to be devised which should make these unnecessary. Of fundamental importance also, were a rapid and satisfactory temperature control, a graphic record of the degree of muscular activity or repose of the individual, and psychometric determinations of the moisture present in the chamber. Finally it was necessary that the apparatus should be so adjustable as to make it likewise available for studying the respiratory exchange according to the Jaquet-Hasselbalch principle, by eliminating the gas meter and simply analyzing the outgoing air.

The clinical respiration apparatus in its finished form consists of: (1) a respiration chamber, suitably illuminated and ventilated, in which the subject may lie comfortably upon a cot; (2) a universal respiration apparatus with a rotary blower for ventilating the chamber, an absorbing system for purifying the air of carbon dioxide and water, and a suitable oxygen supply; (3) accessory apparatus in the form of thermometers, a barometer, and apparatus for recording the pulse-rate and the degree of muscular repose.

In this description of the clinical respiration apparatus, it is advantageous to consider first the universal respiration apparatus.

THE UNIVERSAL RESPIRATION APPARATUS.

The universal respiration apparatus, which was developed in the Nutrition Laboratory and has been used in a considerable number of researches, has already been described in detail elsewhere.³ Since that description appeared several modifications have been made in the apparatus, with particular reference to its adaptation to experiments in which a chamber is used, and hence a further description is desirable here. In principle the respiration apparatus is designed to supply the chamber with a moving volume of air, absorb the carbon dioxide in the outgoing air, replace the oxygen consumed by the subject, and return the air again to the chamber with a chemical composition not materially unlike that of atmospheric air.

In the process of purification the carbon dioxide in the air is completely absorbed, the amount excreted by the subject being determined by the increase in weight of the absorbing vessels. Thus gas analyses, with their attendant difficulties of technic, are unnecessary. The oxygen consumption is quantitatively determined directly by noting the amount it is necessary to introduce into the respiration chamber in order to secure the same volume of air in the chamber at the beginning and end of the experiment, due allowance being made for changes in temperature, pressure, and volume of water-vapor. A schematic outline of the respiration apparatus and chamber is shown in Fig. 1 (See page 906).

The air, as it leaves the chamber through the pipe X, contains the carbon dioxide and water given off by the subject and is also deficient in oxygen, owing to the oxygen required for combustion in the subject's body. The outgoing air is forced by the positive rotary blower R into the absorbing system and passes first into the empty glass Williams bottle A, which serves as a trap to prevent any back suction of acid in case of an accident. The air then passes into the large Williams bottle B, containing concentrated sulphuric acid, and from there into a smaller Williams bottle C, also filled with acid, which acts as a control. The water-vapor is thus completely removed, but the carbon dioxide still remains. On reaching the valve V₁, the air passes into either one of two sets of purifying systems, consisting of soda-lime and sulphuric-acid bottles. The carbon dioxide is completely absorbed by the soda lime in D₁ or D₂ and the water given off by the moist soda lime is also removed by the sulphuric acid in the second vessel E₁ or E₂. In certain instances it is desirable, particularly in long experiments, to insert two soda-lime bottles, and hence Fig. 1 shows sections of the tube, L₁ and L₂, which can be removed and replaced by a soda-lime bottle.

After the air leaves the carbon dioxide absorbing system through the valve V₂, it passes through a can F containing sodium bicarbonate to remove the small unweighable traces of acid

* From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Mass.

vapor, which might otherwise irritate the nose and throat of the subject, and then continues into the respiration chamber shown in the lower part of the figure by way of the pipe Y, Y, Y.

Theoretically, oxygen may be admitted at almost any point in the air-circuit, but here it is represented as being introduced from a large cylinder O through a meter G at a point in the pipe a, a, connecting the spirometer or tension-equalizer S with the chamber. Variations in the volume of the air in the chamber are corrected by means of the spirometer S. In describing the various parts of the universal respiration apparatus more in detail, it seems desirable to follow the course of the ventilating current.

BLOWER.

After experimenting with many different types of blowers, we have found the most satisfactory to be that supplied by the Crowell Manufacturing Company of Brooklyn, N. Y., under the specification No. O-D Rotary Compressor. This can be secured from the manufacturers in a surrounding iron box which is suitable for an oil immersion bath. It is a positive blower in that the air withdrawn from the chamber may be forced through a considerable number of layers of sulphuric acid and soda lime contained in suitable vessels. The rotary blower (see R in Fig. 1) is connected by a leather belt to a small electric motor and can be provided with a safety clutch to prevent the reversing of the wheel through carelessness and the drawing over of sulphuric acid from the water-absorbers. This latter feature has been found of advantage, although the safety trap A has usually prevented the drawing over of the acid into the blower. The speed of the blower may easily be altered by a simple lamp resistance, these blowers usually giving a suitable ventilation—not far from 35 liters per minute—when rotating at the speed of 270 revolutions per minute.

ACID TRAP.

To prevent the possibility of drawing back strong sulphuric acid into the delicate mechanism of the blower, an empty glass bottle A is inserted in the system. While almost any form of bottle can be used for this purpose, it has been convenient for us to employ an empty reversed Williams bottle.

WATER ABSORBERS.

The air leaving the respiration chamber contains a large amount of water-vapor from the lungs and skin of the subject. Before the carbon dioxide produced by the patient is absorbed, it is important to remove this water-vapor entirely from the air. The current is therefore first passed through two or more bottles containing sulphuric acid. Usually one large-sized Williams bottle, B, is sufficient to collect nearly

all of the moisture, but this is followed by a second bottle, C, which retains the last traces of water-vapor.* To facilitate handling and to prevent breakage, each bottle is usually inclosed in a small wire basket with a handle, by means of which it may be suspended directly from a hook on the arm of the balance. When these two Williams bottles are used, it is possible to retain the first one in the circuit until the acid and water have so increased in volume as to render them liable to be carried over mechanically into the second bottle. As much as 100 or 200 grams of water-vapor may be absorbed before a change is required; it is fundamentally important, however, to note that this second Williams bottle, as well as the water absorber following the carbon dioxide absorber, must not increase in weight more than 10 grams before being renewed, and should be controlled by frequent weighing.

TUBING AND PIPING.

The Williams bottles, as well as the soda-lime bottles for absorbing the carbon dioxide are fitted with short lengths of rubber tubing of good quality, to which are attached respectively male and female parts of ordinary garden hose couplings of the standard $\frac{3}{4}$ -inch size (approximately 16 mm. internal diameter). The couplings are, therefore, interchangeable with different forms of apparatus. With a standard rubber hose gasket, the couplings can be made airtight by a simple twist of the hand. All of the piping throughout the apparatus is of standard $\frac{1}{2}$ -inch (16 mm. internal diameter) pipe.

TWO-WAY VALVE.

In order to deflect the main air-current from one set of purifiers to the other, it is necessary to have a two-way valve. The valves V_1 and V_2 are of this type.† A long steel rod connects the two valves in such a way that by throwing the handle at one valve, both are simultaneously turned and the air-current instantly deflected from one set of purifiers to the other.

CARBON DIOXIDE ABSORBING SYSTEM.

The most effective absorbent for carbon dioxide that we have found is slightly moist soda lime.‡ The soda lime containers D_1 and D_2 are wide-mouthed glass bottles. Each bottle contains 2 kilograms of soda lime, capable of absorbing not less than 75 grams of carbon dioxide, and weighs, when filled, about 4 kilograms. The dry air in passing through the moist soda lime absorbs moisture, and it must, therefore, be dried again, which is done by passing it through the Williams bottle E_1 or E_2 .

* The Williams bottles are made for us in Berlin by the Vereinigte Fabriken für Laboratoriumsbedarf.

† These are of standard design made by the Lunkenheimer Mfg. Co., Cincinnati, Ohio.

‡ At present, upon the recommendation of Dr. Eugene F. DuBois of Bellevue Hospital, we are obtaining an excellent grade of soda lime in large amounts from Stanley Jordan & Co., 116 Broad Street, New York, N. Y.

Either series of carbon-dioxide absorbers may be used as desired, for if the air-current has been passing through the series D_1 and E_1 for a given experimental period, the air can be instantly deflected through the series D_2 and E_2 by turning simultaneously valves V_1 and V_2 . The combined increases in weight of the absorbers D_2 and E_1 , or D_1 and E_2 represent the amount of carbon dioxide absorbed. It is possible that the amount of water-vapor given up by D_1 to the dry air passing through it may be actually more than the amount of carbon dioxide absorbed, so that the bottle D_1 may lose in weight. On the other hand, the water-vapor given up is immediately absorbed by E_1 and hence the algebraic sum of the weight of the two bottles gives the weight of the carbon dioxide absorbed. Usually both bottles are weighed on a balance at the same time.

The moisture in the soda lime is essential to the efficiency of the absorbent. The amount of water absorbed by the air-current from the soda lime and collected in the Williams bottle E_1 or E_2 may be determined by weighing the Williams bottle separately. If the soda lime is re moistened with the same amount of water that has been lost, the absorbent may be considerably regenerated. It has been found practicable to add the water through a funnel inserted in the intake of the soda-lime bottle at the end of each day's experimentation. By the next morning the experiment can be carried on as usual.

Although moist soda lime is a most efficient absorber of carbon dioxide, yet it has been thought desirable to test the completeness of absorption by the insertion of a small flask H , containing a solution of barium hydroxide, in such a manner that, by opening the pet-cock P_1 and P_2 , a portion of the air from which the carbon dioxide has presumably been absorbed may be deflected through the barium hydroxide solution, where the slightest trace of carbon dioxide is indicated by a turbidity.

As the amount of carbon dioxide given off by the subject is determined by noting the increase in weight of the soda-lime vessels D_1 or D_2 with its attendant Williams bottle E_1 or E_2 , the degree of absolute moisture in the air when it enters the soda-lime bottle and leaves the Williams bottle should be identical. If, however, the sulphuric acid in the Williams bottle E_1 or E_2 , which follows the soda-lime container, is allowed to accumulate water to such an extent that its efficiency as a water-absorber is somewhat less than that of the Williams bottle C , preceding the soda-lime container, it is obvious that there would be a loss of water from the system as a whole and the amount of carbon-dioxide thus measured would actually be too small by the amount of water escaping absorption. Conversely, if the air is not so dry before it enters the soda-lime bottle as when it leaves the Williams bottle following, there will be an

undue increase in the weight of the carbon-dioxide absorbing system owing to the excess water absorbed. If the routine with the Williams and the soda-lime bottles is carried out as previously outlined, no difficulty is experienced, but it is advantageous occasionally to test the efficiency of the apparatus for absorbing carbon dioxide and water-vapor. Consequently in blank tests, *i.e.* with the apparatus in operation but with no subject inside, it is advisable to weigh the sulphuric-acid and soda-lime vessels separately, and continue passing the air through the system for a half hour. Under these conditions, the loss in weight of the soda-lime vessel should of course be exactly counterbalanced by the increase in weight of the accompanying Williams bottle.

SODIUM-BICARBONATE CAN.

In order to absorb the unweighable traces of acid fumes which may remain in the air after it has been carried through the Williams bottles, it is necessary to insert in the air-circuit a small can F , filled with dry sodium bicarbonate and cotton batting. This completely removes the acid fumes and does not affect the determination of the carbon dioxide or of the oxygen in any way. The sodium bicarbonate does not need frequent renewal, the amount used remaining efficient for approximately a year's experimenting.

OXYGEN SUPPLY.

The point at which the oxygen is introduced may, of course, be varied according to the conditions under which the apparatus is to be used. The direct determination of the amount of oxygen absorbed by the subject may be made either by introducing it from a small cylinder of the gas and noting the loss in weight during the experiment, or by passing the oxygen through an exceedingly delicate and accurate gas meter, as is represented in Fig. 1. Small cylinders of compressed oxygen, which can be readily weighed, may be secured from the Linde Air Products Company of Buffalo, N. Y. These cylinders weigh, when filled, about 3 kilograms, and contain about 150 grams of oxygen with a purity of about 98%.

One of the greatest difficulties in using these cylinders has been the selection of a suitable valve, that furnished on the cylinder by the manufacturer being difficult to utilize, owing to the high pressure under which these cylinders are filled. Formerly recourse was had to one of the numerous types of reduction valves, but a thorough test of these showed no valve which would functionate properly for a long period. One or two types of needle valves have been found which are much less expensive and give a satisfactory closure. Such a needle valve is coupled to the exit of the cylinder, then closed, and the main valve on the cylinder is opened to its fullest extent. The issuing gas may then be very delicately regulated by means of the needle

valve. With so high a pressure it is obvious that the packing around the main valve stem should be excellent so as to give no opportunity for leakage of air. The valves may be tested by immersing the cylinder and valve in water or by weighing the cylinder carefully on a balance, and then again an hour later; any loss of oxygen between the two weighings will be instantly apparent.

Extended experience in respiration experiments has shown that the respiratory exchange is absolutely unaffected by increased oxygen percentages and even by the respiration of pure oxygen, but if the oxygen percentage is lowered to 11 or 12%, respiratory disturbances are apt to appear. In actual practice, the oxygen in this chamber and in the chamber of the respiration calorimeters in this laboratory remains from 20 to 23%.

GAS METER.

From many standpoints, the use of a small weighable cylinder of oxygen is to be recommended. On the other hand, there are certain advantages in favor of using an accurately calibrated gas meter under such conditions as to preclude excessive temperature fluctuations. In our experiments we have almost always employed a large cylinder of oxygen with a needle valve, conducting the gas through a carefully calibrated meter of the type devised by Bohr and manufactured by the Dansk Maalerfabrik of Copenhagen. This meter registers 5 liters for each complete revolution of the drum and may be read directly to 50 c.c. Being constructed of britannia, it may, without injury, be completely immersed in water in a large aquarium vessel and so leveled as to be easily read. The corrections for temperature changes are minimized by this immersion in water. It is not possible, of course, to control the barometric fluctuations, and the meter readings should, therefore, be corrected not only for the average of the temperature fluctuations obtaining throughout the experimental period, but also for the average changes in the barometer. For relatively short periods, this can best be done by using the temperature readings taken at the beginning and end of the period, and the barometer readings taken at the same time.

The meter is calibrated by the method of weighing⁴ the gas delivered from an oxygen cylinder. Many tests of this type of meter show that, when properly installed, it gives admirable results, and when a long series of experiments is contemplated, its use is strongly recommended. A small, weighable cylinder of oxygen is required in either method, since such a cylinder is necessary for the calibration of the gas meter.

The oxygen leaving the cylinder first passes through the small bottle of water, which is immersed in the tank containing the gas meter. This serves to saturate the oxygen with water, for in its compressed state it is extremely dry.

The safety tube in the bottle, as used by Mr. L. E. Emmes of the laboratory staff, has proved most satisfactory, for any sudden inrush of gas is checked by escape through this pipe. After saturation with water the oxygen passes through the gas-meter; as soon as the gas has reached the temperature of the bath, water is neither deposited nor taken from the bath, and the water level remains indefinitely unaltered.

SPIROMETER OR TENSION-EQUALIZER.

Although an absolute temperature control is theoretically possible with this apparatus, thus securing a constancy in the apparent volume of the air in the closed system, it is practically impossible to prevent slight temperature fluctuations, and these, together with the unavoidable and uncontrollable fluctuations in the barometric pressure, indicate the necessity for some form of tension-equalizer which will insure atmospheric pressure in the chamber. For this purpose a small spirometer S is used. When a mouthpiece or nosepieces are employed with the universal respiration apparatus instead of the chamber, the entire air-current passes through the spirometer, and sundry devices are attached to it for tracing graphically the volume of each respiration and for indicating the total ventilation of the lungs. When the respiration chamber is used, however, it is not necessary for the air-current to pass through the spirometer; consequently, the three-way valve V_3 is closed to the spirometer and direct connection is made between the spirometer and the respiration chamber by means of the pipe a, a, a.

The construction of the spirometer is shown only in schematic outline in Fig. 1, and for the details reference must be made to other publications.⁵ As commonly used on the universal respiration apparatus, the spirometer has a content of about $2\frac{1}{2}$ liters. During the development of the clinical chamber a considerably larger spirometer was employed which held approximately $5\frac{1}{2}$ liters, but more recent testing of the apparatus has shown that the standard size is amply sufficient for the purpose. With a small spirometer there is always a possibility that a patient may suddenly make a violent or extended muscular movement inside the chamber, such as in turning over, throwing off the bed clothes, or unduly moving the arms or legs, which would produce an expansion of air that would lift the bell of the spirometer above its normal limits and out of the water, thus causing a leakage of air. The danger of such an accident may, of course, be avoided by the use of a larger spirometer, but it is rarely that even a large subject would make such extraneous muscular movements as would produce this effect. Two practical methods may be employed for preventing it, even with a small spirometer. One is to place a weight of 80 grams on the bell of the spirometer when it is rapidly rising, thus immediately lowering it; the weights can be re-

moved when the conditions inside the chamber have again become normal. Another expedient is to place a bar across the top of the spirometer guide supports in such a manner as to prevent the bell from rising high enough for air to escape. With the use of such devices when necessary, we feel confident that a spirometer with the ordinary volume of $2\frac{1}{2}$ liters is sufficient for use with the clinical chamber. Furthermore, experimental periods in which the muscular activity was sufficient to expand the air unduly would be of little, if any, value. With the use of the small spirometer, however, the operator should take care that no air is lost through an undue elevation of the spirometer bell or the admission of an unnecessarily large amount of oxygen.

The exact height of the bell should be recorded at the beginning and end of each experimental period by noting the position of a pointer attached to the counterpoise and traveling over a vertical millimeter scale. The spirometer bell is delicately counterpoised so as to give zero pressure at approximately a middle point of the scale. There is no particular compensation device used in connection with this spirometer to allow for the variations of the metal displaced as the bell enters or leaves the water; consequently there are, theoretically at least, slight alterations in the tension with the different positions, so that it is advantageous to have the bell in nearly the same position at the beginning and end of each experimental period. The oxygen supply is then shut off and the bell gradually sinks. It is highly desirable that at the end of each period the bell should always be sinking, and thus in part compensate for the slight alteration in tension. More recently we have found it advantageous to move the counterpoise rod up or down by hand at the exact end of the period, until the very delicate petroleum manometer T indicates that there is no pressure. At this point the reading is taken.

MANOMETER.

The small oxygen consumption and the large volume of the respiration chamber with its accessory parts make the influence of slight changes in temperature and pressure of great moment in measuring the total oxygen consumption. Consequently it is essential to note the exact pressure inside the chamber. This is assumed to be atmospheric, but it is possible that the spirometer does not respond instantly to slight changes in pressure; accordingly it is more efficacious to use a very delicate manometer. This manometer T is of the type employed by Pettersson and Sonden in their gas-analysis apparatus and indicates the slightest alteration in atmospheric pressure. It consists of a glass tube bent in the form of an arc and containing a drop of petroleum oil.

BALANCES.

The carbon dioxide elimination is determined with this apparatus not by means of gas analyses, as is customary, but by accurately weighing the soda-lime bottle and its accompanying Williams bottle. These two absorbers have a combined weight of not far from 5 kilograms, and since approximately 10 to 15 grams of carbon dioxide may be produced in a half-hour period, it is necessary to weigh these two vessels to within 0.05 gram. This is done admirably by means of a balance that has been in use in this laboratory for a number of years and which, though relatively inexpensive, has a high degree of accuracy.* The balance, covered with a glass case to protect it from drafts of air, is placed in a suitable location in the laboratory and used for weighing both the soda-lime bottles and Williams bottles, also the small oxygen cylinders required when calibrating the gas meters.

BAROMETER.

One of the most important factors in the accurate measurement of the oxygen consumption is a knowledge of the temperature and of the barometric conditions obtaining inside the large respiration chamber at the end of the experimental period. The measurement of the barometric pressure gave us entirely unlooked for difficulties. From a consideration of the volume of the chamber, *i.e.* about 550 liters, it will be seen that a change of 0.1 millimeter in pressure corresponds to a variation in volume which, as will appear later, affects the measurements of the oxygen consumption by about 72 c.c. Accordingly we recommend the use of the highest grade standard barometers, with special illumination and lens attachment to read to 0.05 mm. Indeed, it can be said that one prerequisite of the successful use of the respiration chamber is a barometer with an exceedingly high degree of accuracy. The necessity for an accurate barometer and the significance of the barometric measurements become greater the shorter the experimental period is. If one is dealing solely with periods of two or more hours, an ordinary barometer, reading to 0.1 or 0.2 millimeters, would be sufficiently exact for the purpose, but when it is attempted to make the experimental periods as short as one-half hour, the most exact barometric measurements are necessary.

CONNECTIONS OF THE APPARATUS WITH THE RESPIRATION CHAMBER.

The universal respiration apparatus was primarily designed for studying the respiratory exchange by using nosepieces or a mouthpiece, and in the schematic outline a mouthpiece is indicated in dotted outline. When the three-way valve V_3 is turned and the coupling M is con-

* The specifications for this balance are as follows: Patent Precision Balance No. 7 II, 10 kilos, with aluminum beam and iron support, black enameled. Manufactured by August Sauter, Ebingen, Württemberg, Germany. The sensitivity with full load is usually 0.01 gram, *i.e.* much better than the manufacturers claim.

connected with the pipe a, a, a, at the point N, the universal respiration apparatus is ready for accurate tests with nose- or mouth-breathing. All that remains is to turn the three-way valve V_4 at the proper moment so as to connect the mouth of the subject with the air-pipe. With the clinical respiration chamber, however, the apparatus is used in an entirely different manner. As seen by the diagram, the main ventilating current of air, instead of passing continuously through the spirometer, is so deflected by the valve V_3 as to pass directly from the chamber to the rotary blower without passing through the spirometer. Furthermore, the returning air, instead of passing along the pipe a, a, a, to the spirometer, goes directly to the chamber through the pipe Y, Y. With this form of connection, therefore, the pipe a, a, a, serves simply as a lead from the chamber directly to the spirometer, which is no longer a part of the ventilation circuit, but has become a true expansion chamber connected with the large respiration chamber.

RESPIRATION CHAMBER.

The respiration chamber is the new part of the clinical respiration apparatus, although here again this is, in a certain sense, but an elaboration of the smaller chambers used for small animals or, more especially, a modified form of the chamber of the bed calorimeter. From the clinical standpoint the chamber is the most important feature of the apparatus.

In designing the respiration chamber an effort was made to secure the perfect comfort of the subject, suitable illumination, absence of psychological unpleasantness or suggestion of confinement and, at the same time, as small a volume of extraneous air as is consistent with these prerequisites. It was necessary that it should be so arranged as to be quickly opened and closed, and that it should be capable of ample ventilation, not only as to the renewal of the air, but as to the movement of the air inside the chamber. Finally, it should be so constructed as to permit quick temperature control.

To meet these conditions a chamber was constructed of sheet copper, 0.5 millimeter thick. This chamber, which is shown in diagram in the lower part of Fig. 1, is in two parts, a base consisting of the bottom of the chamber together with a deep water seal, and the cover of the apparatus. The inside of the chamber is 200 centimeters long and 65 centimeters wide. The cover is curved and so constructed that it rests in the water seal; the closure between the cover and the base is therefore air-tight.* The highest point of the cover is 52 centimeters from the

bottom and the radius of curvature of the top is 34 centimeters. The pipe a, a, a, which leads directly to the spirometer or tension-equalizer and provides for the sudden expansion or contraction of the air inside the chamber, enters through the cover near the ventilating fan i.

The base is substantially mounted on wooden supports h, h, h. Through the bottom are conducted the pipes for the ventilating air-current, including the intake pipe Y and the outgo pipe X. Three small tubes, b, b, b, also project through the bottom. These may be used for connection with the stethoscope, the pneumograph, or for any other purpose.

There are in addition several openings in the cover of the apparatus. A window of plate glass c is placed in a recess of the cover and made thoroughly air-tight with physicists' wax. This may be easily tested at any time by pouring a centimeter of water, d, over it. Provision is made for the insertion of the thermometers and psychrometer and for the insulated connections for the electric fan used inside the chamber. In the top of the cover is a small water-sealed opening, which may be used to pass in or take out small objects, such as a clinical thermometer, a glass of water, urine bottles, or similar articles. This small opening, or hand-hole, is of much practical benefit, also, in removing the cover from the apparatus, for if this hand-hole is not opened, it is practically impossible to lift the cover of the apparatus out of the water seal, owing to the atmospheric pressure. By simply removing the cover of the hand-hole the entire cover of the apparatus may be lifted off in a few seconds without disturbing either the thermometers or the electrical connections. Experience has shown that it is possible to converse freely with the occupant of the chamber without a telephone, and the large window immediately above the subject gives an appearance of light and freedom, with absence of psychological disturbance, which is very much to be desired.

With this hermetically sealed chamber it is obviously necessary to provide for a ventilating air-current and oxygen supply, unless the principle of Kaufmann⁶ is employed and the carbon dioxide is allowed to accumulate. This respiration chamber lends itself admirably to tests by the latter method, if they are desired, as the spirometer which is directly connected with the chamber allows for an expansion of the air without loss of carbon dioxide or a diminution of air. Such an experiment is, of course, limited by the increment of the carbon dioxide percentage. In actual practice, however, we invariably ventilate the chamber by means of the universal respiration apparatus as shown in Fig. 1 and already described. Final adjustment of the pressure inside the chamber is obtained by means of the petroleum manometer T (Fig. 1). While the manometer is shown here as attached near the spirometer S, it may be located at any point near the large chamber without af-

* As the water seal has considerable depth, the apparatus may be adjusted for large subjects by lifting the cover at either end, or as a whole, by means of the pulley arrangement referred to later in giving the routine of an experiment, or by supports placed in the water seal. In this increasing the volume of the chamber it is necessary only to make sure that the depth of water over the lower edge of the cover is sufficient for the complete exclusion of air. This will be found especially convenient in cases of obesity or for heart cases. Usually it will be sufficient to lift only the head end of the cover. The increase in the apparent volume of the chamber is readily corrected for by a simple calculation.

fecting the principle underlying the method of measurement.

CIRCULATION OF AIR INSIDE THE CHAMBER.

To provide a gentle movement of the air which shall aid in the temperature control, thoroughly mix the air in the chamber, and maintain comfortable conditions for the subject, a rotary air impeller, *i.*, of a standard type is installed inside the cover of the chamber. The discharge from the blower is directed towards the curvature of the top in such a way as to blow directly on the wet bulb thermometer and provide for the maximum air movement and equalization of both temperature and composition of air. It is necessary to operate this blower a half hour before the experiment begins so that it may be thoroughly heated to its ordinary running temperature.

TEMPERATURE MEASUREMENTS AND CONTROL.

An accurate and rapid temperature control for this chamber is of fundamental importance, even more important, in a sense, than the comfort of the subject, for to obtain an exact measurement of the oxygen consumption, the difference between the average temperature of the air inside the chamber at the beginning and that at the end of an experimental period must be accurately known. Theoretically an electrical resistance thermometer is to be preferred for obtaining these temperatures. As it was undesirable to complicate the apparatus further by the addition of an electric equipment of this type, four good mercury thermometers, graduated in 0.1°C ., have been used and found to serve the purpose admirably. These are placed at different points in the chamber, the locations being indicated in Fig. 1 by t_1 , t_2 , t_4 , and t_5 . The average readings of these four thermometers give a most satisfactory measurement of the average temperature of the air in the whole chamber, particularly when the subject has been in muscular repose for at least 10 minutes prior to the final reading.

To control the temperature normally the temperature environment of the room is held at such a point as to allow for a rate of normal heat radiation which will keep the temperature of the air inside the chamber not far from 22° to 23°C . In winter this is readily accomplished by a simple adjustment of the windows in the room. In summer it is more difficult, but for the greater part of the year it has been found practical to bring away the heat when necessary by placing a piece of moist cheese cloth over a portion of the top and directing the current of an ordinary electric fan over the surface. In all but the hottest days of the summer this method has proved most satisfactory. In any event, the rapid movement of a current of air over the outside surface of the chamber, either with or without the use of the damp cheese cloth, assists greatly in the temperature regula-

tion. As will be seen later, however, the distribution and sensitivity of the thermometers is such as to compensate for considerable temperature change without affecting the measurements.

METHOD OF RECORDING THE PULSE-RATE.

An accurate record of the pulse-rate is of fundamental importance in all metabolism experiments and is an essential feature of practically every experiment in this laboratory. The usual method employed for such measurements, and the method which was used in the experiments with the clinical respiration apparatus, is for an observer to listen to the heart beat through a Bowles stethoscope attached to the chest of the subject. Connection with the earpiece used by the observer is easily made without change in the air-content of the chamber by means of one of the small tubes passing through the bottom of the apparatus (see *b*, *b*, *b*).

GRAPHIC RECORD OF THE MUSCULAR ACTIVITY.

Practically all respiration experiments with the subject in the lying position are for comparative purposes; an attempt is therefore made to have as nearly as possible identical conditions. A prerequisite for all comparison experiments is that the subject should be in complete muscular repose. The opinions of various experimenters as to what constitutes complete muscular repose vary greatly; hence it has been necessary to obtain some graphic registration of the degree of repose. In experiments with respiration chambers two methods have been used for this purpose, either a Fitz pneumograph placed about the chest or thighs of the subject, or in both locations, and suitable connection with tambours and kymographs to give a graphic record of the movements, or the method used with the clinical respiration chamber, *i.e.* a special form of bed upon which the subject lies, with springs and bearings so adjusted that the slightest change in the centre of gravity in a lateral direction instantly registers by changing the compression of a small rubber ball connected with a tambour and kymograph. With this latter arrangement the slightest muscular movement, even of the hand or foot, is instantly recorded, and occasionally even the respirations have been noted. Respiration experiments without such graphic proofs of the muscular repose are, we believe, entirely worthless.

METHODS OF TESTING THE APPARATUS.

The universal respiration apparatus and chamber just described, although extremely simple in principle, nevertheless have certain complexities. For experiments with patients, therefore, it is necessary to test completely the feasibility of the apparatus for measuring or indicating the several factors. Tests for the efficiency of the absorbing vessels have already been described in connection with the detailed

description of the universal respiration apparatus. Since this method of measuring the respiratory exchange involves a closed ventilating air circuit and depends upon the measurement of the amount of oxygen introduced, any leakage of air either into or out of the chamber would vitiate the whole experiment. It is, therefore, of prime importance to know that the apparatus is absolutely air-tight so that when the cover is properly in place, no air can enter or leave the circulating air-current. Fortunately such tests are very readily made with this type of apparatus.

TESTS FOR TIGHTNESS.

By a consideration of the diagram given in Fig. 1, it will be seen that the entire ventilation current is in a closed circuit, the tension-equalizer or spirometer allowing the volume to expand or contract according to the variations in temperature, pressure, or actual volume of air inside the system. By reading the millimeter scale over which the pointer on the spirometer bell passes, variations in the apparent volume of the air in the chamber may easily be noted.

To test the tightness of the apparatus, the various parts are connected as in an experiment with a subject, and the ventilating air-current started. After the first few minutes, during which the air throughout the whole system will be attaining equilibrium, the bell on the spirometer should reach a constant level, and thereafter the volume of air should remain absolutely constant unless affected by changes in temperature or atmospheric pressure, these being indicated by the readings of the barometer and the several air thermometers. If the changes in the position of the spirometer bell cannot be accounted for by temperature or barometric changes, there is obviously a leakage of air into or out of the system, usually the latter. This may be found by testing the universal respiration apparatus and the chamber separately.

To test the efficiency of the universal respiration apparatus, especially when trying to locate a leakage of air, a water manometer, consisting of two glass tubes connected at the bottom by a short bit of rubber tubing and attached to a suitable standard, is found advantageous. With this device the slightest leak in any individual portion of the apparatus can readily be detected by applying pressure with a bicycle pump. When the respiration apparatus has been properly installed, with accurately fitting rubber gaskets and connections, and suitable inspection is given from time to time, there is no occasion for leakage, and such an occurrence can invariably be ascribed to faulty technic.

To find whether or not the defect is in the chamber, the two ventilating pipes Y and Z (see Fig. 1) may be shut off, leaving the chamber connected only with the spirometer. Under ideal conditions, with no temperature or barometric changes, the volume of the spirometer

will remain constant for an indefinite length of time. To hasten the detection of a leak, it has been our custom to place approximately 80 grams in weights upon the top of the spirometer bell and thus produce a slight pressure in the chamber. With the semi-circular window used in the earlier development of the chamber, leaks were occasionally found between the wax and the sheet of celluloid used for closure, but none were detected at any other point in the cover. In the first base constructed a leak was found by pouring gasoline into the base and noting where it escaped. The openings were so small, however, that they could not be detected by the use of water as it would not pass through them. Under ordinary conditions, if properly constructed, the chamber remains absolutely tight indefinitely, but it is desirable to inspect occasionally the wax closure of the window.

In tests for leakage, temperature and barometric changes are invariably to be expected, and hence it is necessary to compute the volume of the chamber and make corrections for these changes. The volume of the chamber may be found by simple computations based upon the dimensions of the chamber or by the chemical method of introducing a weighed amount of carbon dioxide from a small bottle of the liquefied gas and then computing the volume of the chamber from an analysis of the gas. For all practical purposes the method of computing the volume from the dimensions of the chamber is sufficiently accurate.

In testing the respiration chamber, weights have been placed not only upon the top of the spirometer bell, but likewise on the counterpoise of the spirometer so as to produce a negative pressure; indeed, tests have been made with weights in both positions. Even when there is an increased pressure inside the chamber there is no change of air from the enclosed volume in the chamber to the outside air, thus showing that, when properly constructed and tested, the apparatus is independent of external atmospheric conditions.

In actual experimenting, the spirometer is connected in series with the chamber and delicately counterpoised so that the air in the chamber is practically under atmospheric pressure. Indeed, measurable differences between the pressure in the chamber and the atmospheric pressure are not detected save by the extremely delicate petroleum manometer shown in Fig. 1.

The significance of a leak should be especially emphasized, for if the volume is reduced by the loss of air out of the system, oxygen is added to take the place of the air thus lost. As the oxygen introduced is measured by the meter and is considered as having been consumed by the subject, it will be seen that such loss of air vitiates the accurate measurement of the oxygen consumption. Conversely, if air leaks into the system the amount of oxygen added and measured is too small. So far as the respiration chamber itself is concerned one may confidently state

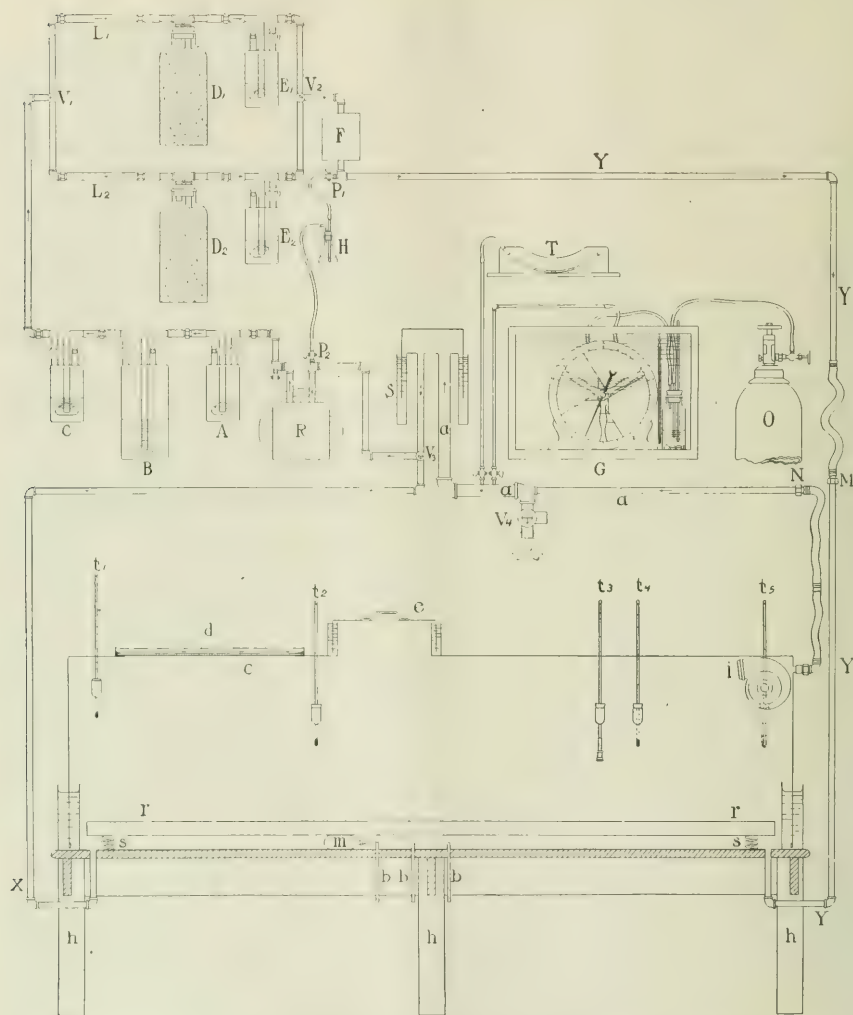


FIG. 1.—Diagram of clinical respiration apparatus.

The upper part of the figure shows the universal respiration apparatus with the following parts: R, blower; A, acid trap; B and C, water absorbers; V₁ and V₂, 2 way valves connecting with the carbon-dioxide absorbing system; D₁ and D₂, carbon dioxide absorbers; L₁ and L₂, removable sections of the piping for the introduction of additional carbon-dioxide absorbers; E₁ and E₂, water absorbers; F, sodium bicarbonate can; P₁ and P₂, and H, pet-cocks and barium-hydroxide container for testing the efficiency of the carbon-dioxide absorbers; Y, Y, tube through which the air freed from carbon-dioxide and water returns to the chamber; M and N, points at which the tubing is connected when the apparatus is used with a mouthpiece or nosepiece; S, spirometer; G, gas-meter immersed in water; O, oxygen tank; T, manometer; V₃ and V₄, 3 way valves; a, a, a, tube connecting chamber with spirometer and oxygen supply.

The lower part of the figure shows the respiration chamber. X, outgoing airpipe; i, blower; c, window with water-seal; t₁, t₂, t₃ and t₄, psychrometer thermometers; t₁, t₂ and t₅, air thermometers; b, b, b, tubes in bottom of chamber for various connections; r, r, bed; s, s, s, springs; m, pneumatic bulb.

that, with proper construction, neither of these disadvantages may be expected.

CONTROL TESTS.

Having tested separately the universal respiration apparatus and the respiration chamber, and having found them tight, it is necessary to demonstrate further the efficiency of the apparatus for measuring the respiratory exchange and particularly the respiratory quotient by making a series of control tests. The control tests used for the clinical respiration apparatus were, in the main, of two types, either chemical tests in which definite quantities of alcohol or ether were burned inside the chamber, or physiological tests with animals either fasting or after surfeit feeding.

ALCOHOL CHECK TESTS.

The use of ethyl alcohol of known composition for testing the accuracy of respiration chambers is of long standing. The alcohol test may be used in two ways. When the respiratory quotient is alone of interest, alcohol may be burned in the chamber and from the ratio between the carbon dioxide produced and the oxygen consumed, the accuracy of the apparatus for studying the respiratory quotient is determined. Thus the theoretical respiratory quotient of alcohol is 0.667. In other words, for every liter of oxygen absorbed in the combustion of alcohol there should be produced 667 c.c. of carbon dioxide. In this type of test it is unnecessary to note the weight of alcohol burned as only the ratio between the oxygen and the carbon dioxide is desired. This test is made very rapidly, and if there is a leak in the chamber or an error in the oxygen introduction or in the absorption of carbon dioxide, the respiratory quotient of the alcohol will be distinctly affected. During the winter of 1914-15, a very large number of alcohol check tests of this type were made in which respiratory quotients materially different from the theoretical quotient were but rarely found.

The second type of alcohol test includes the measurement of the amount of alcohol introduced. From the weight of alcohol used, together with its specific gravity and percentage composition, the theoretical value for the carbon dioxide produced, and the oxygen consumed may then be computed, and these values in turn compared with those actually found by measurement with the respiration chamber. The results obtained during most of the winter of 1914-15 for this type of experiments were distinctly unsatisfactory, for almost invariably only about 95% of theory was found, although usually the same error was observed for both the carbon dioxide and the oxygen. The discrepancy was finally explained by the fact that the burette through which the alcohol was introduced into the chamber had been subjected throughout the tests to the rapid current of air produced by the fan used outside of the chamber for equalizing

the temperature conditions. This caused a vaporization of alcohol from the burette, which does not occur under the usual conditions of making alcohol check experiments. During the summer of 1915 alcohol check tests were made frequently with this apparatus by Mr. L. E. Emmes and Miss M. A. Corson of the Nutrition Laboratory staff, and theoretical values were regularly found for both the carbon-dioxide production and the oxygen consumption. As during the winter we were unable to locate the difficulty, recourse was had to tests with ether.

ETHER TESTS.

The use of pure ether for testing the accuracy of the respiration apparatus was, we believe, first noted in the description of the original universal respiration apparatus.⁷ For testing the original apparatus a small combustion chamber for burning ether was devised. Practically the same principle as there described was employed in the tests of the clinical respiration apparatus except that small glass bottles with stopcocks fused into them were substituted for the sulphur-dioxide tubes previously used.

The arrangement for conducting these ether tests is shown in Fig. 2. A small current of air was taken from a petcock inserted just before the valve V_1 in the pipe leading to the carbon-dioxide absorbing system. (See Fig. 1.) This air, which is normally under pressure, was made to bubble at will through either one of two weighable glass bottles, B or B', containing ether, the flow being controlled by the stopcocks A and A'. As the air bubbled through the ether it became saturated with ether vapor, and this gas was passed through the tube b in the base of the chamber to a micro Bunsen burner G inside the chamber, protected from drafts by wire gauze. At the end of each experimental period the current of air was deflected from one glass bottle to the other. In this deflection it was quite possible that, even with the most favorable conditions, the burning ether flame would be extinguished; accordingly provision was made, as in earlier ether tests, for keeping up the ignition by a high tension electric spark from the terminals of two well-insulated wires w, w passed through the base of the chamber. Under these conditions ether could be vaporized and burned inside the chamber in known amounts at will.

The results of a typical ether test made by this method are recorded in Table II, and show that the apparatus gives most satisfactory results not only for the respiratory quotients of burning ether, but likewise for determining the total amounts of carbon dioxide produced and oxygen consumed for comparison with the theoretical amounts. In consideration of the results obtained in these ether tests, we felt justified in believing that our apparatus was structurally and technically sound for the determination of respiratory quotients, and that we could proceed with the physiological tests.

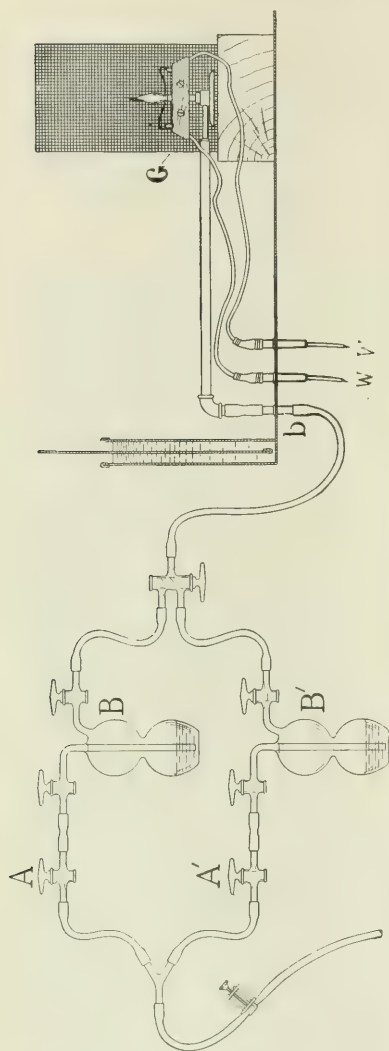


FIG. 2.—Apparatus used in ether check tests.
B, B', ether reservoirs; A, A', stopcocks controlling the flow of air and ether vapor; G, opening through which ether vapor is introduced into the chamber; G, micro Bunsen burner with wire gauze screen; W, W', high tension sparking current.

PHYSIOLOGICAL TESTS.

Naturally the first physiological tests were those made with human subjects. It so happened that certain of the individuals first placed inside the chamber were patients with severe diabetes with whom respiratory quotients were obtained which seemed to us at that time abnormally high. These diabetics had been subjected by Dr. Elliott P. Joslin to the most interesting and successful Allen treatment which, as will be seen later, almost invariably results in increasing the respiratory quotient. Since the quotients were so much higher than those obtained in previous experiments in this laboratory with severe cases of diabetes, a strict search was made for possible physiological errors in the use of the apparatus,* a number of tests being made with animals.

One of the first tests was made with a dog who had been without food for some hours. This gave a series of quotients of 0.75, which was fully in line with what would be normally expected. As the Nutrition Laboratory has for the past two years made a large number of experiments with fasting geese and also with geese after surfeit feeding, the preliminary experiment with a dog was immediately followed by a long series of experiments with geese. Usually six fasting geese were placed in a special cage and put inside the clinical respiration chamber. The respiratory quotient was then determined under various conditions of temperature, ventilation, humidity and duration of fasting. The quotients for the experiments with geese are given in Table III. The results, when compared with

TABLE III.—SUMMARY OF MEASUREMENTS IN A TYPICAL EXPERIMENT WITH FASTING GEESSE† IN THE CLINICAL RESPIRATION APPARATUS, MARCH 5, 1915.

Duration of Period.		Carbon Diox.	Oxygen	Respiratory
Mins.	Secs.	Produced.	Consumed.	Quotient.
		Liters.	Liters.	CO ₂
46	36	8.66	12.06	0.72
45	38	8.02	11.04	.73
47	36	8.09	11.47	.71

† Ten geese which had been without food for about 11 days.

respiratory quotients obtained for the same geese in long experiments with the bed calorimeter.

* The apparently abnormal respiratory quotients obtained with the cases of severe diabetes led to a careful comparison of this apparatus with the universal respiration apparatus with mouth- and nose-breathing and particularly with the Tissot respiration apparatus. In these comparisons we were especially aided by Mr. H. L. Higgins; our thanks are likewise due to Dr. T. M. Carpenter and particularly to Dr. E. F. DuBois, for their helpful criticism. Dr. Elliott P. Joslin not only gave freely of his advice and experience but was also a subject for some of the comparison tests.

TABLE II.—SUMMARY OF MEASUREMENTS IN A TYPICAL ETHER CHECK TEST OF THE CLINICAL RESPIRATION APPARATUS.

Date.	Duration of Period.		Ether Burned. Gms.	CARBON DIOXIDE PRODUCED.		OXYGEN USED.		Respiratory Quotient (Theory 0.666).	PERCENTAGE FOUND	
	Mins.	Secs.		Found. Gms.	Theory. Gms.	Found. Gms.	Theory. Gms.		Carbon Dioxide.	Oxygen.
Jan. 8....	51	4	10.12	23.38	24.04	25.87	26.23	0.657	97.3	98.6
	56	29	10.18	24.00	24.19	26.06	26.38	0.670	99.2	98.8
	51	19	8.67	20.78	20.60	22.67	22.47	0.667	100.9	100.9

meter, were found to be practically identical, thus verifying the results obtained with the clinical respiration apparatus.

As a supplementary study an attempt was made to alter arbitrarily and definitely the respiratory quotient of geese by surfeit feeding. Again it was found that the respiratory quotients which had been observed with the bed calorimeter were likewise obtained under similar conditions with the clinical respiration apparatus. Finally a man was placed inside the chamber, and after the respiratory quotient had been determined in a series of periods to provide a base line, a sugar solution was given. Following the ingestion of sugar, the same elevation of the respiratory quotient was observed as had repeatedly been found in similar experiments with other types of respiration apparatus in this laboratory.

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² Benedict: Deutsch. Archiv. f. klin. Med., cvii, p. 156, 1912.
³ Benedict: Physical Review, Vol. xxii, p. 294, 1906.
⁴ Benedict: Deutsch. Archiv. f. klin. Med., cvii, p. 156, 1912; Benedict and Talbot: Carnegie Institution of Washington Publication No. 201, 1914, p. 43; Carpenter: Carnegie Institution of Washington Publication No. 216, 1915, p. 37.
⁵ Kaufman: Archiv. de physiol., Vol. viii, p. 329, 1896.
⁶ Benedict: Am. Jour. Physiol., Vol. xxiv, p. 372, 1909.

(To be concluded).

CHOLECYSTOSTOMY VS. CHOLECYSTECTOMY.*

By F. B. LUND, M.D., BOSTON.

ON no important question in surgery is there less agreement among men of experience and skill than on the indications for cholecystectomy. In the early days of operative interference, cholecystostomy was always done and the removal of the gallstones was thought to be the important matter, and was so, fortunately, in a majority of the cases. As time went on, however, we were confronted with gallstones without symptoms, symptoms without gallstones, recurrence of symptoms after removal of gallstones; nay even with recurrence of gallstones after operation, and even the post-operative development of cancer. We learned that, while gallstones crystallized around clumps of bacteria and epithelium, and were, therefore, the result of infection, infected bile being found in a majority of acute cases, and the bacteria ranging from streptococcus to the influenza bacillus, the real infection which produced cholecystitis came by the blood stream and was situated in the walls of the gall-bladder and not in its interior; that drainage would naturally

then only temporarily relieve the symptoms superinduced upon a cholecystitis by the plugging of the cystic duct by a stone; and that unless the infection subsided, it was not curative. The enlargement of the glands about the cystic and common duct is evidence of infection. The advantages of cholecystostomy were and still are: (a) that it is often a simpler and safer operation, especially in fat patients with deep chests and high livers, the not infrequent bronchitis, nephritis, etc.; (b) that it provides an easy drainage to the surface for septic bile which has been blocked off by obstruction of the common duct due to stone or external pressure; (c) that in case of (1) stricture of the common duct, or (2) pancreatitis, it affords a simple and comparatively safe method of relieving the condition. In regard to advantage (a), the easier technic, it may be said that increased familiarity with the operation has enabled many surgeons to acquire such skill in cholecystectomy that in a large proportion of cases, it is as simple and safe as cholecystostomy; the choice of the suitable cases requiring a real surgeon, however, and not an amateur. In regard to (b), drainage of bile, we must admit that in case of cholecystitis without jaundice, the supposed necessity of the drainage of bile was an error. Why drain outside when the common duct is clear and the bile passing freely into the duodenum? Can we not remember the weeks of bile drainage to which our unfortunate patients used to be subjected? The cases in which we remove the gall-bladder and tie the cystic duct do just as well. Often no bile drainage takes place and the wound heals quickly; often in a few days there is a gush of bile along the drain carried down to the duct; in other words, if drainage is needed, it takes care of itself.

(c) The need of the gall-bladder for purposes of duodenostomy for common duct stricture or pancreatitis; this is not really against cholecystectomy in suitable cases, but against its indiscriminate employment in cases where common duct stricture is likely to develop or in which pancreatitis is present.

In a case where stones in the common duct require an incision therein, there is always a possibility of stricture, and in these cases the gall-bladder, unless too hopelessly diseased, should be spared. It may be needed for a second cholecystenterostomy. In cases in which we find a swollen pancreas, the so-called interstitial pancreatitis, the gall-bladder should also be drained and not removed, because we may need it for a subsequent cholecystenterostomy. Unless we have stones actually in the common duct and have to open it, we need not worry about stricture of the duct developing. In cases of simple cholecystitis, the removal of the gall-bladder will be a preventive treatment for common duct disease, for it will prevent recurrence of stones, with the possible entrance of the

* Discussion before the American Gastroenterological Association, Washington, D. C., May 3, 1916.

latter into the common duct, with the results hereinbefore mentioned. Unfortunately, in a large majority of cases of common duct stones, the gall-bladder is so thickened and contracted that its efficient use for drainage is impossible, and the question of removal is, therefore, not affected by these considerations.

The recent experimental demonstration that after cholecystectomy in animals a so-called compensatory dilatation of the common duct occurs, has led to the suggestion that cholecystectomy instead of cholecystenterostomy would be the proper procedure in chronic pancreatitis. The loss of the function of the gall-bladder as a pressure regulator is the alleged reason for the dilatation of the common duct after its removal. It seems doubtful if the dilatation would take place under the actual conditions of pressure on the thin-walled duct by the swollen head of the pancreas. As a preventive of pancreatitis, however, the removal of the gall-bladder, by favoring dilatation of the duct and providing free drainage, would appear to have a favorable influence.

We all remember that on largely empirical evidence some fifteen or eighteen years ago, certain surgeons were advocating the removal of the gall-bladder in the majority of gallstone cases, and that for years the influence of the Mayo Clinic was against this, as not providing drainage. Accumulated experience, however, has shown that recurrence of symptoms after cholecystostomy, especially in cases of cholecystitis without stones, is far from uncommon. Certain men of experience have roughly rated it as 25%. The reason for this is evident, if, as we now believe, the infection is in the wall of the gall-bladder and not in the bile. Actual recurrence of gallstones is also not uncommon. I have personally re-operated and found gallstones from five to six years after operations of my own, in which I feel certain the stones reformed and were not left behind.

The subsequent development of cancer in a gall-bladder from which stones had been removed has occurred five times in my experience.

We learn now that the procedure in the Mayo Clinic has so changed that cholecystectomy is performed in 90% of the cases, an interesting commentary on the modern trend; but we also learn that many surgeons of prominence and skill do not endorse cholecystectomy in so large a proportion of cases.

In the matter of the advantages, and, what is even more important, the safety of cholecystectomy in any given case, the surgeon must be his own judge, using his own experience and knowledge as his guide. Blind adherence to the so-called dictum of any authority is not only unsafe but often fatal in this most complicated, interesting, and important branch of our art.

Cholecystectomy is indicated in the following cases:

1. In cases of very thick, acutely inflamed, bright-red, or gangrenous gall-bladders due to impaction of a stone in the cystic duct.

2. In cases of chronically thickened gall-bladders. Here (a) the thick walls cannot contract and drive out the bile, so that what bile gets back into the gall-bladder it is sure to stagnate there; and (b) after cholecystostomy, the walls do not contract, so that we get a mucous sinus for a long time or forever.

3. In cases of gall-bladders very much distended with clear fluid from impaction of a stone in the cystic duct. Here the duct has been closed and probably ulcerated and strictured by the irritation of the stone, so no bile gets back. In these cases, removal is usually technically simple.

4. Whenever suspicion exists of malignant disease.

5. In chronic cholecystitis without stones, but with moderate thickening and ulceration of the mucous membrane, giving little yellow spots on the mucous surfaces, the so-called "strawberry gall-bladder." These do not get well with drainage alone.

6. In chronic cholecystitis without stones but with adhesions to the surrounding organs, especially the pylorus, which cripple the latter and cause symptoms. Here, also, drainage alone is only temporarily efficient. The gall-bladder is a constant focus for low-grade infection and adhesions, which will continue to form and perhaps to spread until its removal; all these processes being attended with discomfort and invalidism to the possessor of the organ.

Clinical Department.

REPORT OF A CASE OF SACRO-ILIAC STRAIN FOLLOWING SYMPHYSIOTOMY.

BY CHARLES F. PAINTER, M.D., BOSTON.

THERE have been differences of opinion in the medical profession regarding the possibility of lesions of the sacro-iliac joint ever since attention was called to its possible injury or luxation. By a considerable part of the profession there has been a tacit agreement that lesions of this articulation are possible; that in a certain few instances such lesions as have been described are demonstrable by physical signs peculiar to themselves, but in a majority of cases the diagnosis of this condition will have to be made upon the results of treatment of a like nature to that which admittedly brings relief to patients who have demonstrable sacro-iliac disturbance. A small part of the profession rejects the evidence offered to prove that such lesions exist, whereas a very few, among whom are some anatomists,

declare emphatically that such lesions could not possibly occur because there is no such thing as a sacro-iliac joint and there is no mobility possible between the bones in this region. It is in accordance with the history of many new conceptions in medicine that this should have been received in this manner. It is time, however, for one who seeks to interpret clinical observations in this region to abandon the ground that there can be no such lesions, because there is no such joint, for both the existence of the joint and the possibility of motion in it are capable of proof. It is true that the joint is not like any other joint in the body, though it possesses ligaments and interarticular structures that are similar to, if not a duplication of, the tissues interposed between bones in any of the other large articulations. I fancy that the reluctance to accept, as proof, any of the arguments offered to establish the identity of this joint rests upon the feeling that in order to predicate an articulation one must be able to demonstrate motion between the bones that compose it. The very nature and location of this particular articulation make it impossible to demonstrate such motion by the pursuit of those methods ordinarily applicable to a joint in which it is desired to demonstrate mobility. As for dislocations of the sacro-iliac joint, they undoubtedly do not occur except where the violence is very great, so great in fact, as to crush the pelvis more or less extensively. The slight luxations which may occur and which are consistent with the structure of the sacro-iliac joint could not reasonably be expected to give rise to any outward evidence of their existence. In any of the joints of the body at which luxations or dislocations occur the degree of the displacement is, in a way, proportionate to the amount of motion of which the joint is capable. A joint with a small range of motion would be capable of being displaced to a very slight degree. A deeply-seated joint, such as the sacro-iliac, possessing only the slightest possible motion, shows practically no sign that could be interpreted to mean luxation. Even the radiograph reveals nothing, for the reason that those indications which might be looked upon as evidences of this are so slight that they are well within the limits of error in the taking of pictures and could not fairly be admitted as evidence on this point.

It is because so much question has been raised by those who are skeptical about the existence of sacro-iliac mobility that the following case seemed to be worth reporting. The existence of motion in these joints was first claimed by obstetricians. That, as has already been said, there is no demonstrable motion recognizable by any tests that it is possible to make in the normal individual is unquestionably true. Occasionally in very severe traumatism there is an actual displacement of these articulations such as has been seen in cases where fractures of the pelvis have been sustained. Chronic sprains of the

sacro-iliac joints are not uncommon and in these cases the evidence of the effect of slight mobility in these articulations is clearly shown by the production of lipping at the periphery of these joints.

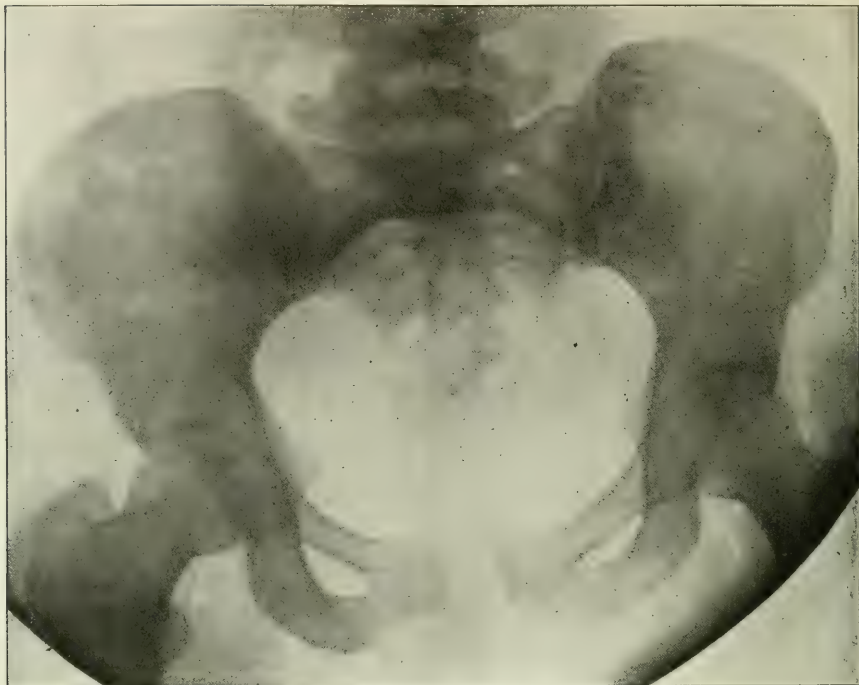
The patient who is the subject of this report is a young married woman of 30 who had her first child four years before she was examined by the writer. She was of a rather high strung, nervous type, who had never had any serious illness. During her pregnancy there were no unusual phenomena noted. The labor proved so difficult that symphysiotomy was employed as the measure likely to bring the best result to child and mother. Convalescence was very slow and painful, and she experienced great difficulty in walking. She was almost paralyzed in both legs. Pain in the lower back was severe, and there was pronounced sense of instability in the low back and hips. She had been a very active woman, and the discomfort caused by the attempt to follow out the accustomed activities of her life plus those incident to the care of an infant wore on her a great deal, and made a nervous invalid of her after two years. She persisted in being active partly because she thought she ought, and partly as a result of advice given her on the basis of her neuroathenic tendencies. The physical exhaustion following upon the forced activities which were prescribed and the pain referred to the lower back, buttocks and thighs, finally forced her to give up, and it was at this juncture that the writer first saw her in the fall of 1914.

She was an extremely healthy appearing young woman. Color good, rather over weight, but of fair muscular tone. In walking there was no notable disturbance of the gait. The back on inspection presented nothing abnormal either in contour or mobility. There was tenderness to deep pressure over the base of the sacrum and along the line of juncture of the sacrum with the ilia. When lying down thigh flexion with the extended leg caused some pain in the low back and at the symphysis pubis. It was also slightly tender over the symphysis to deep pressure. Motion of the hips in all direction was normal. Forced hyperextension of the thigh caused pain at the symphysis pubis.

An x-ray of the sacro-iliac region shows a wide separation at the symphysis (nearly one inch), and a marked lipping of the sacrum and ilia at the sacro-iliac joints, caused apparently by the abnormal mobility, slight though it was, of these articulations resulting from the separation at the symphysis. The sense of insecurity in the pelvic joints was undoubtedly explained by this abnormality.

As she was too stout for mechanical measures to offer very much likelihood of relief, it was decided to try and render the pelvic articulations more stable by wiring the symphysis. The day before the operation a plaster model of the lower back, the buttocks and both thighs was taken. This was re-inforced on the posterior half and the anterior half was cut away so that after the operation she could be made to lie in this plaster shell.

Under ether anesthesia a transverse incision was made over the symphysis about $4\frac{1}{2}$ inches in length. The two bones were found separated somewhat more than an inch and the intervening space was filled with fibrous tissue. By lateral compression over the trochanters after the removal of the fibrous tissue and refreshing the ends of the bones so that the cartilaginous surfaces were roughened up somewhat, it was possible to press the ends of the rami



Note the liping of the bone at the lower end of the sacro-iliac joints. Also observe the separation at the symphysis pubis. The pubic bones are certainly three times as far apart as the normal.

of the pubes almost together. A heavy silver wire was passed through each ramus about $\frac{3}{4}$ of an inch proximal to their articulating surfaces, and while the bones were crowded together by an assistant, the wire was drawn tight and twisted with the knot on the side away from the pelvis. A few stout animal tendon sutures were made to bridge over the gap and reinforce the silver wire. The wound was closed tightly with silk worm gut and a tight swathe was applied, exerting its pull on the pelvic bones in such a fashion as to prevent their gaping. The patient was put back to bed in her plaster, posterior shell, and compelled to maintain that position for two full weeks. At the end of that time she was permitted to be moved a little from side to side, still in her cast. Convalescence was uneventful except for some difficulty in micturition at first. This was overcome in a few days. At the end of three weeks she was removed to her home, and for the next six weeks she remained recumbent. After that, for the following month, she moved cautiously and gradually improved, so that she went about more and more. Her nervousness became less and she was able to walk with freedom and quite comfortably.

She has now no trouble at the seat of the suture and she can walk just about as rapidly and as well as ever. There are now no symptoms and the patient is quite as active as her custom had been.

As has been said earlier in the paper, one of the most striking features in the case has been

the evidence of hypermobility at the sacro-iliac joints; this was associated with a severe backache and gave ocular evidence of its existence by the pronounced liping of the sacro-iliac joints, as shown by the x-ray. It may be maintained that, even though one admits the validity of the claim that motion in these joints is evidenced by the liping of the bones making up the joint, this is due to the fact that there was no connection at the symphysis. There never is a bony connection and though the abnormal separation in this patient may, and undoubtedly did, aggravate the already existing mobility, still there is abundant evidence that these joints are in existence and I submit have been subjected to the diseases to which other joints of the body have been subjected. No better evidence is needed than this in proof of the existence of these joints; and if joints, then motion must follow to some degree at least.

Such a case as this cannot, now at least, be of very common occurrence. Aside from its interest from the clinical standpoint, it has been very instructive as furnishing proof of the reality of mobility at the sacro-iliac joints, thus going far to prove that though unlike other articulations they resemble them in their essential features.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

AMERICAN MEDICAL ASSOCIATION.

THE sixty-seventh annual session of the American Medical Association was held last week at Detroit, Mich., from June 12 to 16, and the programs of scientific sections and of affiliated and non-affiliated organizations were carried out successfully. Over 5,000 members of the Association were in attendance. Principal addresses were made by Dr. Albert L. Van der Veer, of Albany, N. Y., who succeeded the late Dr. William L. Rodman of Philadelphia as president of the Association, and by Dr. Rupert Blue, the new president.

It is interesting to compare these addresses with the annual discourse for the Massachusetts Medical Society at its recent session by Dr. David L. Edsall, which is published as the leading article in this issue of the JOURNAL. Dr. Van der Veer spoke chiefly of medical pre-

paredness. Dr. Edsall deals particularly with movements in medicine as they have affected the status and character of physicians, and the relations of medicine to the community. Dr. Blue, in his presidential address, perhaps with less of a backward glance, concerned himself rather with the larger problems of the medical profession now insistent for solution. At some length he considered the subjects of medical and sanitary education and preparedness, the possibilities of enlargement of the usefulness of hospitals, the improvement and standardization of medicinal preparations. He considered also the more domestic topics of health insurance, industrial hygiene, rural sanitation and public health organization. With reference to the latter he pointed out, in closing, the part which the American Medical Association, and physicians generally, should take in future efforts towards the solution of these problems.

"The great effort of the future must be in the direction of the improvement of the internal health of the nation. We are possessed of an adequate coast defense against disease from abroad, and what we must do now is to control those diseases which are already with us. In this we require the qualified health officer and the educated public. A part of this education may be secured by the printed and the spoken word, but the great agent in public education is demonstration. This Association is in a position, touching as it does every stratum of society in this broad land of ours, to carry this work forward to ultimate fruition. This is an obligation on our profession, a sacred duty laid on the followers of the healing art. Though we minister to the sick and bind up the wounded, though we bring sight to those who see not, and alleviate the suffering on the bed of pain, yet our duty is not done until we have put forth our best endeavor to the end that sickness and pain and blindness be not. Poverty and ignorance, squalor and intemperance, cruelty and greed,—these are the enemies which we as individuals and as a profession must combat. As citizens who would maintain our nation in a condition of preparedness against its greatest enemy,—disease,—it is our duty to perform not only our legal obligations as physicians, but to bend our every energy to the prevention of disease. No selfish or half-hearted service will suffice. Nothing short of whole-souled devotion to this duty will satisfy the ideals which have been passed down to us by generations of self-sacrificing, public-spirited physicians who love their fellow men. The American Medical Association represents the crystallization of these ideals. If it permits no self-seeking interest to dominate its actions, if it maintains its plane of high altruism, if it devotes itself with strength of purpose to the betterment of the

public weal, it will prosper in the future as in the past, serene and sure in the satisfaction of work well done. Let our deliberations be so imbued with that broad spirit of charity and brotherhood that the name of the physician shall be revered."

Dr. Blue referred also, in his address, to the death of four leading physicians in the United States during the past year, whose loss is felt by the profession at large,—Dr. Edward L. Trudeau, Dr. George M. Sternberg, Dr. Henry B. Favill and Dr. William L. Rodman.

THE PROBLEM OF THE CONVALESCENT.

It is a common experience with those who deal with large groups of cases in the dispensary or in the open ward to feel that the cases are not properly rounded off. They get over the acute illness, the painful symptoms are relieved and, to make room for other cases, they are discharged into the world to take up the economic struggle again, unfitted though they may be. Of course in most of our private cases the period of convalescence means merely a time of idling about, reading, taking rides, the object of commiseration by friends and relatives, but in these other cases there is no such possibility. Once deprived of the care of the hospital, they must go back to their daily work again or else drift into pauperism. One would, of course, like to keep such cases in the hospital much longer, but the problem of room for the acute cases is usually an urgent one and beds are at a premium. The best we can do is to urge them to return to the hospital dispensary regularly, but we know that this is in many cases impossible.

Writing in the *Modern Hospital* for June, Dr. Frederic Brush calls attention to this problem, for which he believes there are two main methods of solution. These may be called the home and the institution methods. The home method is an amplification of the "follow-up" system of many hospitals and comprises instruction of the family in the management of such cases. The advantages are the tonic effect of "going home" on the patient, the preservation of the family, as well as its hygienic education and the economy, as compared with the other method.

The convalescent hospital is the solution of

the problem for those cases not suitable for home convalescence. It is especially designed for the following classes of cases: Surgical dressing cases, selected cardiac and rheumatic cases, post-typhoid cases, tuberculosis, especially of bone and kidney, and certain mental cases. Such an institution should be located in the suburbs of a city, where it could combine plenty of acreage with accessibility to a large city hospital, with which it should be connected. Dr. Brush is superintendent of a hospital of this kind, and finds it suitable for cases recently operated on for empyema, pyelonephritis, recent fractures, and other cases not ordinarily associated with such a hospital. He finds that patients such as sailors and laborers, recovering from such a disease as typhoid, make rapid recoveries, instead of deteriorating socially, as they too often do when discharged directly into a large city; and such patients prove extremely grateful and are among the best testimonials to the efficacy of the hospital.

Dr. Brush believes that in New York about 10,000 adults should take advantage of the convalescent hospital every year, although, as a matter of fact, only 500 actually do. Cooperation must be obtained from large employers of labor, from school authorities and from social workers everywhere.

SMALLPOX IN GERMANY.

THE Imperial Bureau of Health for Germany makes an exhaustive report on smallpox in that country for the three years 1911-1913, inclusive. During this three-year period there were registered 718 cases, the best year being 1913, when there were only 90 cases, the lowest since registration began in 1896, with one exception.

The comparative frequency of smallpox among the vaccinated and unvaccinated is, of course, interesting. Unfortunately, there is no way of estimating, even approximately, the ratio of one class to the other numerically, but it seems safe to say that the vaccinated outnumber the unvaccinated by many times to one; so that when we find 113 cases among persons known to be unvaccinated and 574 among the vaccinated the superficial inference is untrue. Of the 574 among the vaccinated, too, we find nine cases vaccinated without result, 27 vaccinated too late, and 42 revaccinated too late.

There remain 235 cases vaccinated once and 261 revaccinated. In many of these cases vaccination had been done a great many years before; for instance, there were two cases of 47 and 51 years, respectively, each of whom had been vaccinated at 12.

The disease showed a much milder course among the vaccinated and the mortality was less. Thus there were 39 deaths among 113 unvaccinated, a mortality of 54.5%, while among the vaccinated ones there was a mortality of only 4.2%, and among those revaccinated it was only 3.8%. Among those cases which recovered, the disease took a lighter course in the vaccinated. In 73 unvaccinated cases, where the nature of the course was known, 40 cases were severe and 33 mild. On the other hand, of 223 cases vaccinated once, the course was mild in 159 and severe in 64. Of 251 cases revaccinated, the disease took a milder course in 192 and was severe in only 59.

The moral of the above is easy to point. It has been dwelt upon from time to time by health authorities and illustrated wherever a nation or a community issues a report such as the above; in spite of which, crusades are still organized against vaccination.

MUTISM FOLLOWING TRAUMA.

A GREAT many conditions having their origin in emotional stress acting upon a neurotic constitution arise during the course of a great war such as the present one, and on account of their frequency are often not recognized as being identical with the same conditions appearing at intervals only in time of peace. There have been, for instance, many cases quoted of mutism following shell explosions, and the question has arisen just how much of the symptom picture is hysterical and how much is due to disturbances in atmospheric pressure acting upon the nervous system.

In the *Lancet* for May 20, Dr. Arthur J. Hall cites the case of an 11-year-old boy who was subjected to a series of emotional shocks. He was knocked down by a taxi-cab; about a year later was in Hartlepool when that city was bombarded by the German ships; and about six months later happened to be near a gunpowder explosion of great violence. He acted rather peculiarly after this, and six months later,

when told that he was to undergo an operation for tonsils and adenoids, became suddenly mute and remained so for six weeks, only recovering upon receiving a severe fright.

A correspondent of the *British Medical Journal* writes from southeastern France, in the issue for May 27th, describing the case of a soldier who was buried by the explosion of a shell at Verdun, and, when disinterred, was found to be mute. He remained in this condition for two weeks. He was put at hard manual labor in a vineyard and his speech suddenly returned. It seems probable that in such cases as the above, the exciting cause is only the summation of stimuli, all of which would have been impotent, except for the neurotic background.

Hall tells us that in his case, the boy had come to dominate the household, and he truly observes that this state of affairs was probably the original cause of the condition. In the other case, the soldier retained his mutism as long as he was the centre of attention in a ward, but when put to hard work, he discarded it as a useless expedient. All this agrees very well with Adler's views on the desire of the neurotic to dominate every environment in which he finds himself—if by no other way, then by making himself difficult to deal with so that events must be ordered to adapt themselves to him.

MEDICAL NOTES.

A LARGE LEGACY.—Report from White Plains, N. Y., on June 7, states that the will of the late Mr. George R. S. Schrader of that city, who died on November 15, 1915, bequeaths his entire estate, estimated at \$3,000,000, to the New York Association for Improving the Condition of the Poor.

NORTHWESTERN CATHOLIC HOSPITAL ASSOCIATION.—The annual conference of the Northwestern Catholic Hospital Association was held in Milwaukee, Wis., on June 9, 10 and 11. Principal addresses were delivered by Dr. Henry A. Christian, Dr. John T. Bottomley, Dr. John W. Lane and Dr. Michael J. Cronin of Boston. Dr. Bottomley was elected a member of the executive board of the Association for the ensuing year.

PREVALENCE OF MALARIA, MENINGITIS, PELLAGRA, AND OTHER INFECTIONS.—The weekly report of the United States Public Health Service for June 9, states that during the month of

April, 1916, there were in Arkansas 169 cases of malaria, 59 of pellagra, and 136 of smallpox. During the same period there were in Kansas 5 cases of cerebro-spinal meningitis, 276 of smallpox and 70 of typhoid fever. There were 413 cases of smallpox in Illinois.

AMERICAN ACADEMY OF MEDICINE.—The forty-first annual convention of the American Academy of Medicine was held last week at Detroit, Mich., on June 12. At the concluding session, Dr. J. E. Tuckerman of Cleveland was chosen president of the Academy for the ensuing year, in succession to Dr. George A. Hare of Fresno, Calif., the retiring president.

NEW YORK FLOATING HOSPITAL.—The new Floating Hospital of St. John's Guild, the *Helen C. Juilliard*, was open for inspection on June 7. The Department of Health was represented by the Director of the Bureau of Child Hygiene and the Chiefs of the Division of Baby Welfare and School Medical Inspection. The boat is a model of its kind, containing all the necessary wards, apparatus and equipment for the care of 1200 persons. A unique feature is an arrangement on the backs of the benches whereby individual hammocks can be swung for the babies, keeping them directly in front of their mothers, yet giving the mothers freedom of action and a chance to take advantage of the fresh air. The Bureau of Child Hygiene co-operates regularly with St. John's Guild in distributing tickets for the daily trips made by this boat. It feels that, with the new boat and its complete equipment, great benefit will result to the babies of the city during the coming summer. As the result of contributions made by inspectors of the Department during the year 1902, the Department of Health has an endowed bed on board this boat.

ALUMNI ASSOCIATION, MEDICAL DEPARTMENT, UNIVERSITY OF BUFFALO.—At the recent annual meeting of the Alumni Association of the Medical Department of the University of Buffalo, announcement was made that pledges to the amount of \$10,000 had already been obtained for the alumni fund. The following officers of the Association were elected for the ensuing year: President, Walter D. Greene, Buffalo; first vice-president, William H. Bergtold, Denver, Colo.; second vice-president, Henry A. Eastman, Jamestown, N. Y.; third vice-president, Ross G. Loop, Elmira, N. Y.; fourth vice-president, Henry A. Stadlinger, Buffalo, N. Y.; fifth vice-president, M. Louise Hurrell, Rochester, N. Y.; secretary, Julius Richter, Buffalo, N. Y.; treasurer, Frank E. Brundage, Buffalo, N. Y.; trustee for five years, Lesser Kauffman, Buffalo, N. Y.; executive committee, W. F. Jacobs, chairman, William G. Bissell, Harry R. Trick.

LOW DEATH RATE IN NEW YORK.—From figures given out by Health Commissioner Emerson, it appears that in every borough except

Richmond, the New York death rate was lower last week than during the corresponding week of last year. Altogether this represented a saving of 149 lives. The death rate last week was 1.39 lower than the rate for the corresponding week of last year. This decrease is equivalent to a saving of 149 lives. In other words, had the death rate for the corresponding week of last year prevailed last week, 149 more persons would have died in the city. The death rate was 12.72 for last week as compared with 14.11 for the week ending June 12th, 1915. The total number of deaths reported last week was 1362. This reduction in the death rate was secured chiefly through a reduction in the mortality of the acute infectious diseases, of which measles, scarlet fever, diphtheria and typhoid fever showed an immense reduction. The mortality of whooping cough and cerebro-spinal meningitis was slightly higher. As might be expected with the reduction of the acute infectious diseases, there was also a reduction in the respiratory diseases, bronchitis, lobar pneumonia and broncho-pneumonia all claiming fewer victims during the past week than during the corresponding week of last year. Pulmonary tuberculosis was reported as having been the cause of death in 174 cases as compared with 159 for the corresponding week of last year. This increase, however, was practically offset by a decrease in the deaths from other tuberculous diseases. The mortality of heart disease was considerably lower, but the mortality of Bright's disease was sufficiently high to overcome the reduction in the mortality of heart disease. The death rate for the first 24 weeks of 1916 was 15.02, as compared with 15.28 for the corresponding period of 1915.

EUROPEAN WAR NOTES.

UNUSUAL FEVERS IN WAR.—In the issue of the *British Medical Journal* for May 27 are noted two recent contributions in German medical literature, describing two unusual fevers which have been observed in the Austro-German armies,—the first known as five-day fever, the second as gaiter-pain fever.

"In a German field hospital on the east front, Professor H. Werner¹ observed thirty-four cases, at first diagnosed as influenza, which subsequently showed a distinctive five-day type of fever. In each bout of fever the temperature rose to 38° to 40° C. for twenty-four hours, but sometimes for forty-eight hours. During the three to four days' interval the temperature was steady. After a succession of such bouts the temperature ceased to rise and convalescence set in. The fever was accompanied by headache and pain in the limbs. The spleen was painful and the bones, particularly the tibiae, were tender. The patients were very tired and nervous. The rigor accompanying the rise of temperature was followed by a sense of excessive heat

¹ *Monat. med. Woch.*, March 14, 1916.

and perspiration, suggestive of malaria. The enlargement of the spleen was hardly demonstrable between the attacks of fever, during which the patients were flushed. In the afebrile interval they were pale and sometimes slightly jaundiced. The pain in the limbs increased during the febrile period and did not completely cease even when the temperature was normal. The micro-organisms of typhoid fever, malaria, and relapsing fever were not found. Possibly this five-day fever was an aberrant form of relapsing fever; and it was presumably identical with the 'febris Wolhynica' described by His early in 1916.

"Under the heading 'Gaiter Pain' several Austrian writers have described a condition the most characteristic feature of which was severe pain in the shins. More than 200 such cases were observed by Dr. A. Grätzer¹ alone, from December, 1914, onwards, when his battalion was stationed on the Nida. In conjunction with Dr. Zanko he found that this 'gaiter pain' was only one symptom, among many others, of a condition to which they gave the term 'influenza polonica.' The onset of the disease was acute, the temperature being sometimes over 40° C. at the outset. Severe headache was accompanied by stabbing pain in the region of the left costal arch, by great exhaustion, and frequently at first by constipation. Apart from the high temperature and considerable enlargement of the spleen, there was little objective evidence of disease. The spleen was strikingly hard, its lower border was sharply defined, and it was very tender. Herpes labialis was observed in a few cases. After three to four days, when the temperature had fallen below 38° C. and the headache had almost ceased, pain developed on the inner surface of the tibiae, of equal intensity on both sides. It was variously described as dragging, compressing, and throbbing. Its intensity was moderate in the morning, greater in the afternoon, and often unbearable at night. During the next few days the temperature became subfebrile or normal, and the spleen smaller and less tender. Large doses of salicylates and complete rest were alike useless, and it was only with a combination of morphine and veronal that a few hours' sleep could be secured. The disease sometimes lasted four to six weeks, during which the intensity of the pain showed slight variations, and the temperature was normal, or almost normal. At the end of this period improvement or recovery occurred, but in most cases during the following months there were frequent relapses accompanied by only slight rises of temperature, and hardly ever by any swelling of the spleen. The duration of a relapse was seldom as long as three weeks, but the pain was, as a rule, just as severe as at the first attack. Dr. Grätzer found large doses of quinine, given over a long period, shortened the course of the disease, and in many

cases aborted relapses. The majority of the patients had never worn any kind of gaiter, and only in the case of an officer did the distribution of the pain coincide with the area covered by his gaiters."

WAR RELIEF FUNDS.—On June 17 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	\$126,794.16
Allied Fund	119,345.82
French Wounded Fund ...	89,217.86
Army Hut Fund	58,225.60
British Imperial Fund ...	57,731.44
French Orphanage Fund ..	54,030.88
Armenian Fund	46,789.19
Surgical Dressings Fund ..	36,030.67
Belgian Tobacco Fund ...	27,352.75
Facial Hospital Fund	22,116.55
Italian Fund	19,872.56
P. S. D. Fund	9,031.83
Artists' Fund	2,397.62

BOSTON AND NEW ENGLAND.

BOARD OF HEALTH, CITY OF WORCESTER, MASS.—The annual report of the Worcester Board of Health gives the death rate of that city as 14.53 per 1000; excluding deaths at both state hospitals, it is 13.33; excluding non-residents, it is 12.34. This is the lowest death rate in half a century. The records of the city begin in 1864, when the rate was 30.68 and this was exceeded once, in 1872, when it was 31.41. As a cause of death, organic diseases of the heart have first place, followed by pneumonia, tuberculosis of the lungs, Bright's disease, apoplexy, and diarrhea and enteritis in children under two years. Of communicable diseases reported, there were 349 cases of tuberculosis, 342 of diphtheria, 144 of scarlet fever, 134 of ophthalmia neonatorum and 124 of whooping cough.

HOSPITAL BEQUESTS.—The will of the late Anna Bolton Matthews of Boston, who died on May 30, was filed in the Suffolk Registry of Probate on June 8. It contains many charitable bequests, among which a considerable piece of property is given to the Brookline Free Hospital for Women for the ultimate erection of a Cancer Hospital. The sum of \$5000 is given to the Waltham Baby Hospital, and the residue of a \$70,000 trust fund to the Industrial School for Crippled and Deformed Children and the New England Hospital for Women and Children. Specific bequests of real estate, of varying values, are made to the Boston Nursery for Blind Babies, the Children's Convalescent Home at Wellesley, the Children's Hospital, Boston, the Boston Floating Hospital, the Baldwinville Cottage Hospital and the Vincent Memorial Hospital.

¹ *Wien. Med. Woch.*, March 9, 1916.

Massachusetts Medical Society.

ANNUAL MEETING OF THE COUNCIL.

JUNE 6, 1916.

The annual meeting of the Council was held in the foyer of the Copley-Plaza Hotel, Boston, Tuesday, June 6, 1916, at twelve o'clock, noon. The President, Dr. Charles F. Withington, was in the chair and the following 120 Councilors were present:

BARNSTABLE.

E. E. Hawes, M.N.C.

BRISTOL NORTH.

W. H. Allen, V.P.

Sumner Coolidge.

R. D. Dean.

F. A. Hubbard, M.N.C.

BRISTOL SOUTH.

E. F. Cody.

E. F. Curry.

W. A. Dolan.

R. W. Jackson.

ESSEX NORTH.

F. B. Pierce, V.P.

R. V. Baketel.

I. J. Clarke.

E. H. Noyes.

J. J. O'Sullivan.

F. W. Snow, M.N.C.

ESSEX SOUTH.

C. H. Bangs.

R. E. Bicknell.

N. P. Breed.

P. P. Johnson.

Butler Metzger.

FRANKLIN.

G. P. Twitchell, M.N.C.

HAMPDEN.

J. M. Birnie, M.N.C.

T. S. Bacon.

E. L. Davis.

M. B. Hodskins.

E. A. Knowlton.

A. G. Rice.

HAMPSHIRE.

M. W. Pearson.

MIDDLESEX EAST.

E. C. Fish, M.N.C.

W. H. Keleher.

G. N. P. Mead.

MIDDLESEX NORTH.

J. V. Meigs, V.P.

E. J. Welch.

J. A. Gage, C.

MIDDLESEX SOUTH.

W. D. Swan, V.P.

M. H. Bailey.

H. T. Baldwin.

C. H. Cook.

H. F. Curtis.

E. A. Darling.

D. C. Dow.

A. W. Dudley.

G. W. Gay.

C. M. Hutchinson.

A. A. Jackson.

G. A. Miles.

C. E. Mongan.

J. F. O'Brien.

Godfrey Ryder.

MIDDLESEX SOUTH (cont.)

Joseph Stanton.

E. H. Stevens, M.N.C.

J. O. Tilton.

Julia Tolman.

G. T. Tuttle.

C. T. Warner.

G. W. W. Whiting.

NORFOLK.

T. F. Greene, V.P.

J. W. Bail.

A. N. Broughton.

P. W. Carr.

H. C. Ernst, C.

M. H. A. Evans, Tr.

C. B. Faunce.

R. W. Hastings.

G. W. Kaan.

Bradford Kent.

W. A. Lane.

Harry Linenthal.

T. J. Murphy, M.N.C.

A. P. Perry.

J. W. Pratt.

Victor Safford.

T. M. Shea.

NORFOLK SOUTH.

C. S. Adams.

J. C. Fraser, M.N.C.

E. N. Mayberry.

PLYMOUTH.

A. A. MacKeen.

Gilman Osgood.

F. J. Ripley.

F. G. Wheatley.

SUFFOLK.

E. S. Boland.

G. W. W. Brewster.

E. M. Buckingham, T. M.N.C.

W. L. Burrage, S.

David Cheever.

A. L. Chute.

E. A. Codman.

J. A. Cogan.

G. A. Craighn.

R. L. DeNormandie.

Albert Ehrenfried.

C. Frothingham, Jr.

C. M. Green, C.

W. C. Howe.

R. W. Lovett.

J. L. Morse.

Abner Post.

Anna G. Richardson.

W. H. Robey, Jr.

G. G. Sears.

G. C. Smith.

Richard M. Smith.

H. F. Vickery.

D. H. Walker.

C. F. Withington, P.

WORCESTER.

G. O. Ward, V.P.

F. H. Baker.

W. P. Bowers.

J. T. Duggan.

Homer Gage.

David Harrower, M.N.C.

A. G. Hurd.

W. L. Johnson.

F. H. Washburn.

WORCESTER (continued.)

C. D. Wheeler.

S. B. Woodward.

WORCESTER NORTH.

A. A. Wheeler, V.P.

E. L. Fiske.

A. P. Mason, M.N.C.

E. A. Sawyer.

The reading of the records of the last meeting was dispensed with. The names of the Nominating Committee were read by districts and the Committee retired. In the absence of the chairman of the Committee on Publications and Scientific Papers, the Secretary read, by request, an announcement that the Shattuck Lecturer in 1917 will be Dr. Richard P. Strong, of Boston. Dr. Charles M. Green presented the report of the Committee on Membership and Finance, and it was accepted by vote. The report is as follows:

Gentlemen:

The COMMITTEE ON MEMBERSHIP AND FINANCE makes the following recommendations as to membership:

1. That the following-named Fellows be allowed to retire, under the provisions of Chapter I, Section 5, of the by-laws:

Cushing, Ernest Watson, of Boston.

Durgin, Samuel Holmes, of Duxbury.

Gardner, Clarence Rhodolphus, of Northampton.

Lane, Albert Clarence, of Woburn, with remission of dues to the amount of \$15.

McClean, George Chesley, of Springfield.

Woodbury, Louis Augustus, of Groveland.

2. That the following-named Fellows be allowed to resign, under the provisions of Chapter I, Section 7, of the by-laws:

Ellis, William Raymond, of Brookline.

Haddock, Charles Whitney, of Beverly.

Jenness, Burt Franklin, U. S. Navy (Retired), of 3418 Fort Boulevard, El Paso, Texas, with remission of dues to the amount of \$19.

Couch-Mora, Mary, of Porto Rico.

Murphy, John Patrick Henry, of Washington, District of Columbia.

Taylor, Jubal George, of Los Angeles, California, with remission of dues to the amount of \$5.

Thorpe, Burton Durrell, of Newport, New Hampshire.

3. That the following-named Fellows be allowed to change their district membership, without change of legal residence, under the provisions of Chapter III, Section 3, of the by-laws.

Atwood, Blanche Louise, from Plymouth to Norfolk.

Mansfield, James Albert, from Middlesex South to Norfolk.

Pavlo, Samuel George, from Middlesex South to Suffolk.

CHARLES M. GREEN, *Chairman*,
ALGERNON COOLIDGE, JR.,
SAMUEL CROWELL,
FREDERIC W. TAYLOR,
ALFRED WORCESTER.

The Secretary read the reports of the committees appointed at the last meeting to consider the petitions of E. H. Ferguson, Joseph Shohan and G. W. Ellison for restoration to the privileges of fellowship, and the Council acted favorably on all, considering each petition separately.

The petitions of the following for restoration were read and committees appointed to consider them respectively:

For J. D. Taylor	T. F. Leen W. B. Robbins H. F. Vickery C. E. Prior
For E. J. McCarthy	F. W. Plummer W. H. McLean C. H. Bangs
For C. A. Oak	N. P. Breed Butler Metzger

The report of the Committee on Ethics and Discipline was read by Dr. J. A. Gage, and was accepted and approved unanimously. (See Appendix A for this report.)

Dr. H. C. Ernst read the report of the Committee on Medical Education and Medical Diplomas as follows:

Mr. President and Gentlemen:

On behalf of the COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS, I beg to present the following record:

Breaking the usual custom, this Committee had no representative at the Conference of the Council on Medical Education of the American Medical Association and has therefore no report to make.

Exercising its authority to rule upon diplomas from schools not on the accepted list and presented by candidates for Fellowship in the Massachusetts Medical Society, one case was disposed of as is indicated by the following vote, taken on May 1, 1916:

"To recognize the degree of Dr. John R. McPeake of Mattapan, for the purposes of his examination by the Censors for Fellowship in the Massachusetts Medical Society. The action of the Committee was based upon information received in letters written by Fellows of the Society endorsing Dr. McPeake's professional and personal qualifications."

The Committee presents a revision of the list of approved medical schools and colleges of the United States and Canada. This revision was carefully worked out by Dr. Newhall of the Committee, in accordance with the new list of the American Medical Association and, if adopted, will lead to a number of changes.

Respectfully submitted,

HAROLD C. ERNST, *Chairman*,
C. F. PAINTER,
H. W. NEWHALL,
J. F. BURNHAM,
C. FROTHINGHAM, JR.

Voted: To accept the report.

The revised list of medical colleges, diplomas from which are accepted from applicants for fellowship, that had been submitted by the committee just named, was approved by vote. A motion to reconsider this vote was lost by a voice vote. The revised list is a part of this record.

Dr. W. H. Robey, Jr., read the report of the Committee on State and National Legislation and it was accepted. The report follows:

The COMMITTEE ON STATE AND NATIONAL LEGISLATION of the Massachusetts Medical Society has been actively interested in the following bills which have been brought before the Legislature during the winter:

Bill 1093 provided for the licensing of midwives but did not make provision for their education. It stated that a person might attend a woman in normal childbirth but should not use any instrument nor

assist at the childbirth by any artificial, forcible or mechanical means except in an emergency. It gave untrained and ignorant persons rights which would increase puerperal infection and other damage to mother and child. The bill was rejected in the House.

Bill 1088 permitting unvaccinated children to attend school was rejected in the House after a hard fight.

Bill 1090 on the administration of herbal remedies would have made it lawful for a certain "herb doctor" to practise without license, without knowledge of diagnosis, and without the control of the State Board of Registration in Medicine and would have opened the way for many charlatans. The bill had a considerable number of active proponents, but was finally defeated in the House.

Bill 1164 provided for a return to an unpaid State Board of Insanity and was favored by your Committee and by many of our alienists. The bill has just been signed by the Governor. It differs from the original bill in only one particular, which is, that the chairman, with salary, shall be selected by the Governor instead of by the Board.

Bill 702 authorizes counties to build tuberculosis hospitals to provide for the care of cases of the smaller towns and has been signed by the Governor. On the other hand, the bill which favored the removal of incorrigible tubercular patients to certain institutions was defeated.

Bill 1861 provided for the establishment of an Administrative Bureau of Registration comprising the Boards of Medicine, Dentistry, Optometry, Embalming, Pharmacy, Nurses and Veterinary Medicine. It was opposed by our Committee and was referred to the next General Court.

Bill 253 providing for research by the State Department of Health relative to the prevention of syphilis and authorizing the Department to spend, for the purchase of salvarsan and its derivatives, the sum of ten thousand dollars, has been passed.

The recommendations of the Board of Registration in Medicine providing for a report to the Board, by clerks of courts, of certain persons convicted in the courts where said clerks are employed, and that certain applicants not examined should be reimbursed, were both adopted.

Bill 1089 for the registration of nurses was defeated.

All of the bills for milk legislation finally centered in the McLaughlin Bill which was defeated, after a great amount of hard work. The legislation with reference to the Industrial Accident Board is given in a special report by Dr. F. J. Cotton.

The Committee wishes to thank all those who have given the time to help in these important matters, and especially the medical members of the Legislature.

CHARLES F. WITHERINGTON, *Chairman*,
GEORGE W. GAY,
WALTER P. ROWERS,
FRANK G. WHEATLEY,
WILLIAM H. ROBEY, JR., *Secretary*.

Dr. Annie L. Hamilton read this report of the Committee on Public Health, and it was accepted:

Report of the COMMITTEE ON PUBLIC HEALTH.

Immediately after the Annual Meeting last year a meeting of this Committee was held and plans were started for a vigorous campaign to promote public health instruction throughout the Commonwealth.

The Secretary was asked to write to the Secretary of each District Society, asking for the names of members competent to give addresses on the various topics of public health, sanitation or hygiene, including preventive medicine. It was not at all expected that these lists should be more than a help in selecting those who might later be asked to cooperate. Several of the secretaries seemed to understand this,

while others felt that too much was being required of them.

Feeling that before we tried to find audiences we should know what we could offer, a number of our leading speakers were either personally interviewed or written to, and in almost every case the person was willing to speak if called upon.

It was part of our policy to work absolutely in accord with the State Board of Health and the Boston Board of Health.

The best method of reaching the public is by exhibits, lectures, lantern slides, which include maps, diagrams, and statistical tables for comparison as to the birth rates, death rates, infant mortality, prevalence and decline of communicable and other diseases dangerous to public and individual health. The full time public health officer, especially trained for this work, is the one best fitted to carry it on. One who must compete with the local physicians cannot properly do it. These are the methods of the boards of health. Their plans were also at a formative period last summer, as the two staffs had been but recently appointed.

It soon became evident to your Committee that we had thought out a plan almost exactly like theirs, and were actually interviewing many of the same men and asking their cooperation with us. While the spirit with which we were met was a most generous one of willing helpfulness, we saw that we could only try to do in a small way what they were trying to do in a large way, with much more time and much more ready money and equipment at their disposal. We would simply cover part of the same ground less effectively.

Our work has been rather limited for these reasons.

It was thought that by reaching the Fraternal Insurance Companies and there giving plain talks on health, much might be accomplished. Accordingly, letters were written to several of the largest and most influential companies, but the idea was not taken up enthusiastically by them. It seemed they were already receiving as much instruction upon such subjects as they felt the need for.

We have continued our affiliation with the Massachusetts Federation of Churches and the two Committees have met and talked over various methods of advancing public health work.

Dr. Abby Noyes Little, who has carried on the work of the Sub-Committee on Women's and Children's Welfare, has resigned, as she is now doing good work in a little settlement in Kentucky where there is no other doctor within fifteen miles.

Respectfully submitted,

MILTON J. ROSENAU, *Chairman*,
W. IRVING CLARK, JR.,
ENOS H. RIGELOW,
ROGER I. LEE,
ANNIE LEE HAMILTON, *Secretary*.

Dr. F. J. Cotton reported for the Committee on the Workmen's Compensation Act. He said:

"Your Committee was appointed in 1913 to consider the working of the Workmen's Compensation Act in relation to the medical profession. In the past we have reported that the workings of the Act, under the so-called gentlemen's agreement with the insurance companies, under the administration of the Industrial Accident Board, was fairly satisfactory. This seems no longer to be true—the spirit of the verbal agreement is not being lived up to fully, and it seems to us that the time has come for some action by the Society looking to the assertion of the rights and privileges of the profession. Since there is at present great interest, and even excitement, over the situation, it seems to us unwise to do more than to present this situation and such plans of action as have been suggested, thus throwing the matter open for discussion and constructive action by the Society.

With this purpose in view, we ask for the acceptance of this report."

F. J. COTTON, *Chairman*,
W. A. DOLAN,
S. E. WOODWARD,
F. W. SNOW,
R. J. MEIGS.

Voted: To accept the report and discharge the Committee. On motion by Dr. A. N. Broughton, seconded by Dr. F. B. Pierce, it was *Voted:* That a committee of five be appointed by the chair to continue the work of the committee just discharged, and the chair appointed as such a committee, A. N. Broughton, W. A. Dolan, F. W. Snow, R. J. Meigs, E. A. Knowlton.

Dr. Homer Gage presented a report for the Committee appointed to consider Hospital Efficiency. (See Appendix B for this report.) *Voted* to accept the report. On motion by Dr. Gage, it was voted, according to the provisions of Chapter III, Section 4, of the by-laws, to establish a Section of Hospital Administration to meet at the annual meetings of the Society.

The Librarian read this report and it was accepted:

REPORT OF THE LIBRARIAN.

The Librarian reports that during the past year he has attended to the various duties of his office, reporting to the BOSTON MEDICAL AND SURGICAL JOURNAL payments of annual dues, changes of addresses, etc., in order that the Fellows may receive the JOURNAL promptly.

A second issue of the Annual Directory of the Officers and Fellows was compiled and issued as a supplement to the JOURNAL. It is desired most earnestly that the Fellows and the District Secretaries will report at once any changes of addresses, that the next edition may be as accurate as possible.

Respectfully submitted,

EDWIN H. BRIGHAM, *Librarian*.

Dr. Cook introduced and explained this amendment to Section 1, Chapter IV, of the By-Laws, and it was moved and seconded that it be adopted:

Chapter IV, Section 1.

In the second line, after the word "president," insert the word "ex-presidents," and in the third line omit the word "and," and after the word "treasurer" insert the words "and librarian," so that the section shall read as follows:

"Section 1. The council shall consist of councilors chosen by the district societies, and the president, ex-presidents, vice-president, vice-presidents *ex officio*, secretary, treasurer and librarian of the general society, and the chairman of each standing committee.

Voted: To approve the amendment.

The chair spoke of the action of the Legislature in appointing a Recess Committee to study the subject of Industrial Health Insurance, of the bills that have been introduced into the Legislatures of Massachusetts, New York and other states, and of the need of safeguarding the interests of the medical profession, and he asked for authority to appoint a committee to consider this subject.

Voted: That the Chairman appoint a committee of three on Industrial Health Insurance. In accordance with this vote he appointed F. J. Cotton, W. H. Merrill, F. W. Anthony.

On motion by Dr. Dolan, it was *Voted*: That the Committee on Industrial Health Insurance use their best efforts to prevent the taking away from the practitioners of the State the privilege of the attending their own private cases.

The Nominating Committee having returned, presented this list of nominees, and on proceeding to ballot, the tellers reported that 102 ballots had been cast, all for the list as presented, and the President declared them elected:

President, Samuel B. Woodward, Worcester; Vice-President, Frederic W. Taylor, Cambridge; Secretary, Walter L. Burrage, Boston; Treasurer, Edwin M. Buckingham, Boston; Librarian, Edwin H. Brigham, Brookline; Orator, Philemon E. Truesdale, Fall River.

The President nominated and the Council appointed the following standing committees for the ensuing year:

Of Arrangements.—E. L. Young, Jr., J. H. Young, J. L. Huntington, R. H. Miller, C. H. Lawrence, Jr., Donald Macomber.

On Publications and Scientific Papers.—G. B. Shattuck, E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green.

On Membership and Finance.—C. M. Green, Algonon Coolidge, Jr., Samuel Crowell, F. W. Taylor, Alfred Worcester.

On Ethics and Discipline.—J. A. Gage, J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever.

On Medical Education and Medical Diplomas.—H. C. Ernst, C. F. Painter, H. W. Newhall, J. F. Burnham, Channing Frothingham, Jr.

On State and National Legislation.—S. B. Woodward, F. G. Wheatley, W. P. Bowers, W. H. Robey, Jr., S. Stone.

On Public Health.—M. J. Rosenau, W. I. Clark, Jr., Annie L. Hamilton, E. H. Bigelow, R. I. Lee.

Adjourned at 1.35 P.M.

WALTER L. BURRAGE, *Secretary*.

APPENDIX A.

REPORT OF THE COMMITTEE ON ETHICS AND DISCIPLINE, 1915—1916.

The work of this Committee has largely increased in recent years. During the 42 years that the Committee on Ethics and Discipline has existed, 53 meetings have been held. Of these, 36 occurred during the first 39 years, an average of less than one each year; while during the last three years 17 meetings have been held. Coincidentally, there has been an increase in the number of cases affecting the welfare of our Society that have been referred to the Committee, and complaints have been received not only from members, but from various State boards and even from the laity. This increase of work has not only demanded more of the members' time, but has presented many new and difficult problems for solution, and has been made possible only by the efficient coöperation of our Secretary.

In reviewing the work of the Committee since its inception, we find that it has dealt with cases of advertising and endorsing patent medicines, false representations as to qualifications for admission, consultations with irregular practitioners, joining other medical societies, immoral personal conduct, doing of abortions, and failure to obey the State health laws.

The question of what constitutes improper advertising has been one that has called for the serious consideration and discussion of the Committee. Today there is a vast amount of advertising by mem-

bers of this Society, not only covering the whole field of the sanatoria, but specifying specialties and methods of practice; while the forms of indirect and illustrated advertising are legion.

Whether the Society should establish a guiding principle and policy in regard to this matter is open to debate, but it seems irrefutable that what is tolerated in one case should not be condemned in another.

During the last two years your Committee has had to consider a number of complaints against members for advertising their practice in the public press, and has held that such practice, if persisted in, might well constitute cause for resignation from the Society.

Charges that a member of this Society advised and offered to assist in procuring an abortion were tabled because witnesses would not testify before the Committee.

Charges preferred by the State Board of Registration in Medicine against a Fellow for aiding an irregular practitioner to practise medicine were referred to the President for discipline. His letter follows:

October 23, 1915.

W. L. Quennell, M.D.,

Dear Sir:—Our Committee on Ethics and Discipline has reported to me that, having received charges against you of assisting an illegal practitioner of medicine to evade the law, and having notified you of the same, you did not appear before them but sent them a letter in which you acknowledged the truth of the charges and therewith transmitted your resignation from the Society. I beg to say that if this resignation, which now comes before the Committee on Membership, shall be accepted, that acceptance alone will save you from the severe public censure which would deservedly follow an act so contrary to the spirit of the law, dangerous to the public health and violative of professional ethics.

Yours truly,

CHARLES F. WORTHINGTON, *President*.

In a second case of like character the evidence seemed to exonerate the doctor from wrong intentions and upon his disavowal of intentional misconduct and assurances of future care, it was reported to the President and placed on file.

But one case charging neglect in ophthalmia neonatorum has been presented since our last report, apparently indicating that the previous action taken by your Committee has stimulated more prompt and careful handling of these cases.

Charges were preferred against a Fellow by a patient, accompanied by a request that he be allowed to have a public hearing where he might present witnesses under oath, and also by a petition to the same effect signed by 25 fellow citizens. After investigation, the Committee found no evidence of dishonorable conduct, and found no probable cause to institute trial. In denying the petition for a hearing the Committee emphasized the fact that its function is that of a grand jury and not that of a board of trial before which cases are to be tried.

Early in February, 1915, the attention of the Committee was called to certain public utterances appearing in the press reflecting upon the medical profession, and formal complaints were received from individuals, and a District Medical Society. At a later meeting in February, 1915, the subject was fully considered, and it was voted that the Secretary should write to Dr. Richard C. Cabot, asking whether he made the remarks ascribed to him, and whether on other occasions he had publicly made similar statements reflecting on the ethical standards of the medical profession. His reply was published in the *Boston Medical and Surgical Journal* of Feb. 18, 1915. (See letter to Boston *Herald*.)

On Dec. 7, 1915, the Committee on Ethics and Discipline voted that a letter be sent to Dr. Richard C.

Cabot, asking him if his remarks at the Evans Memorial, Nov. 16, 1915, were correctly reported, and asking for his position in the matter. The letter is as follows:

December 10, 1915.

Dr. Richard C. Cabot,
1 Marlborough Street, Boston,

Dear Doctor Cabot:—

On Tuesday, December 7, the Committee on Ethics and Discipline of the Massachusetts Medical Society was called upon to consider certain complaints which had been made by different individuals and which were based upon recent press reports purporting to represent correctly your views of some aspects of medical practice. The meeting of the Committee was held immediately following a conference called by the President to consider these complaints, at which were present the President and three ex-presidents of the Society, together with the full membership of the Committee on Ethics and Discipline. At this conference it was brought out that a recent address of yours, as reported in the newspapers, had elicited numerous unfavorable opinions not only from the profession, but also from the laity, and it was further indicated that there is a prevailing impression that comments reflecting seriously upon the honor and intelligence of your fellow practitioners are allowed by you to circulate freely without due regard for the possible harm which may ensue from their publication.

The Committee has at hand clippings from various newspapers of or about the date of November 17, which contain accounts substantially agreeing in detail, of an address delivered by you at the Evans Memorial, November 16, 1915; but with respect to the accuracy of these accounts the Committee has no information whatever.

Knowing that physicians are often misquoted in the papers, and with a desire to clear up certain points of doubt in regard to your real attitude, the Committee would be glad to hear from you either by letter or in conference at a time of mutual convenience.

Respectfully yours,

WALTER L. BURRAGE,

*Secretary of the Committee, under
the By-Laws of the Society.*

In reply the following was received:

Boston, December 10, 1915.

Dear Dr. Burrage:—

I enclose a copy of a letter which I sent to the Boston Herald the day after its very false and misleading report of my address appeared. I have not seen any of the reports of the other papers, but if they are as false as the Herald, they no doubt will have given just offense to physicians.

I wish you would ask Dr. F. B. Percy of Brookline, or Dr. F. L. Richardson of the Evans Memorial, both of whom were present, whether anything that I said seemed to them of the character which has been complained of.

Yours sincerely,

RICHARD C. CABOT.

The letter to the Boston Herald reads as follows:

(Published Feb. 18, 1915, in the BOSTON MEDICAL AND SURGICAL JOURNAL but not in the Boston Herald.)

To the Editor of the Herald:

I wish to protest against the headlines set over the very inaccurate account of my talk at Evans Memorial last evening. The mistakes in the body of the account are not, most of them, very vital, but to represent me as saying that "nine-tenths of doctors guess," is in the first place false, as I never said it, and in the second place meaningless. If it means that nine-tenths of doctors sometimes guess, it must be true of ten-tenths. If it means that nine-tenths of

them habitually guess or guess nine-tenths of the time, as many would suppose on reading the headline, it is in my belief entirely untrue, and very unjust to the body of the medical profession.

I am not trying to contrast hospital physicians with other physicians, but to contrast the treatment which any physician can give when he has the advantages of hospital laboratories and instruments of precision, with the treatment which that same physician or any other could give without these aids. It is a difference not of personalities but of methods, and I protest against reports which make it appear falsely, that I think ill of the efforts and fidelity of most physicians.

(Signed) RICHARD C. CABOT, M.D.

At a meeting of the Committee on December 21, 1915, the following letter was approved, and it was unanimously voted to send the same to Dr. Cabot, as expressing the Committee's attitude:

Boston, December 21, 1915.

Richard C. Cabot, M.D.,

Boston, Mass.,

Dear Dr. Cabot:—

Twice within the last year the Committee on Ethics and Discipline have received complaints from the members of the Massachusetts Medical Society in regard to your public utterances as spread over the country through the press. After mature deliberation and correspondence with you in regard to the matter, we feel that the complaints are justified.

The statements, as printed, lead the public to believe that the motives and practices of the majority of your fellow practitioners are unworthy,—a belief that you yourself must admit to be incorrect,—and a disclaimer in the medical press does not correct the wrong impression obtained by the public. Therefore, such a course tends to do an injustice to those who, like yourself, are constantly striving to improve the public health, and does not meet with our approval.

We believe that any member of the profession desiring to improve existing conditions of practice, or to introduce entirely new methods of practice, should first present his views before the members of the profession, where his claims, if approved, can receive the endorsement of the Medical Society, or, if false, can be challenged and corrected. By such a method, authoritative statements can be made that will enlist the approval and cooperation of the public, and enhance both the influence of the medical profession and the confidence of the community. We feel that to present the public with information less well digested redounds to the injury of both parties.

Finally we wish to call your attention to the unselfish efforts of the profession at all times to instruct the public in regard to their health, and the oft-expressed opinion that we should carefully forego any statements that are likely to mislead the public.

*Signed by all the members of the Committee on
Ethics and Discipline.*

A letter to Dr. Cabot in January, asking for a reply to the Committee's letter brought the following:

January, 25, 1916.

Dear Dr. Gage:—

I had not expected that your Committee desired an answer from me. I should have supposed that the time for you to hear what I have to say was before you condemned me—not after!

But if you desire an answer you must tell me what it is that you charge me with. You have never yet made that clear. The document which you enclose refers to "a course" which you condemn. (Par. second.) But you nowhere describe that course.

1. Did you disapprove of my course in saying what I did say?

But that you don't know, and, I believe, have made no genuine effort to find out. You cannot, therefore, disapprove it.

2. Did you disapprove of what the newspapers printed?

So did I, but you know that I didn't say it. You cannot, therefore, disapprove it.

3. Did you disapprove of my not contradicting the newspaper report?

But I did all I could, or anyone could, to contradict it, and was refused publication in the daily press. I then contradicted the statement in the BOSTON MEDICAL AND SURGICAL JOURNAL.

You cannot disapprove this? What more could I do?

4. Did you disapprove my trying to introduce "entirely new methods of practice"?

But I referred to nothing not at least eight years in existence, and repeatedly described by me and others before medical audiences before it was heard by the laity.

Hence you can't disapprove of me here!

Whenever you will plainly state what you disapprove of, I will answer you fully, and will convince you that you have treated me with the grossest injustice. Luckily, you cannot hurt me in the least.

Yours cordially,

RICHARD C. CABOT.

At a meeting of the Committee, February 2, it was voted to send the following letter to Dr. Cabot:

Dear Dr. Cabot:—

In reply to your letter of January 25, 1916, we wish to add the following: We have consulted the doctors to whom you referred us in your original letter and we have taken other measures to make ourselves acquainted with the import of your remarks and the impression they made upon the audience. Furthermore, we have in print the impressions you conveyed to the representatives of several of the Boston newspapers who reported your lecture, consequently we feel that we were amply justified in our conclusions, and we consider that more than one such talk constitutes "a course of action."

Your assumption that we intended to do you an injustice or to hurt you in the least is due, we think, to a misapprehension. What we intended to convey to you was the idea that a great many of your fellow practitioners felt that you had been unfair to them in your public utterances—which, if true, constitutes an injustice—and we hoped that a realization of this fact would lead you to confine your public utterances to statements well within the facts. In closing, we wish to state finally that our former letter expresses fully the convictions of the Committee, and we also wish to inform you that we feel it our duty to present these letters as a report on our action to the President and Council, to whom we are responsible. Whether you wish your correspondence to be included in the report we will leave to your decision.

Yours very truly,

J. A. GAGE, *Chairman*.

The foregoing comprises the correspondence upon this subject and concludes this report of the Committee on Ethics and Discipline.

J. ARTHUR GAGE, *Chairman*,

J. W. BARTOL,

HENRY JACKSON,

G. DE N. HUGH,

S. B. WOODWARD.

APPENDIX B.

REPORT OF THE COMMITTEE ON HOSPITAL EFFICIENCY.

At the last Annual Meeting of the Council, the Committee on Hospital Efficiency recommended the appointment of a Committee, to consist of representatives of the medical, surgical and administrative departments of the hospitals of the State, further to consider the means of increasing their medical and surgical efficiency, and to prepare a plan for a uniform hospital report, which, upon the approval of the Council, should be recommended to the favorable consideration of the hospitals of Massachusetts.

This recommendation was adopted, and a Committee appointed, which begs leave to submit the following report:

It seemed best to concentrate our efforts this year upon the subject of medical and surgical statistics as presented in the annual hospital reports. The tendency for some years past has been to present these statistics in greater and greater detail of division and subdivision, until they have come to occupy a very large part of the report, to require much labor and time in their preparation, and to add very considerably to the cost of printing. All of this without any corresponding increase in their value to the profession or to the public.

We have felt that it was possible to have some system by which all necessary information could be given more simply, more economically, and just as clearly as it is done now, and your Committee submits herewith a tentative plan for this purpose. We realize that it is far from perfect, and shall welcome any criticism or suggestion that may be offered.

The plan is founded upon the report made to the Clinical Congress of Surgeons at its Boston meeting, by a committee of which Dr. E. A. Codman of Boston was chairman, although it differs much in some important details.

Each department of the hospital, such as the medical, surgical, and the different specialties may present the statistics of cases treated, in a table which need occupy, at most, not more than a single printed page,—usually much less.

Transversely, the table may be divided according to an anatomical, vertically, according to a pathological classification, as illustrated in the accompanying specimen, which shows the actual surgical work of a hospital treating 3000 in-patients a year.

It will be seen that the classification adopted in this specimen is quite different from that recommended to the Clinical Congress of Surgeons,—it is modelled more nearly after that in use at the Roosevelt Hospital in New York.

Its method of preparation is as follows: Every patient, on admission, is given a number, and upon discharge the records are filed or bound in numerical order. The same number is entered upon a very much enlarged table similar to the one here shown, as the discharge card and record are received from the ward, *e. g.*, if the case were one of cholelithiasis, its number would be entered in the space opposite Liver, Bile Ducts and Pancreas, and under Foreign Bodies including Calculi; if a uterine fibroid, opposite Uterus and Ligaments, and Benign Growths, and so on.

At the end of the year, the number of all the uterine fibroids are under the Benign Growths of the Uterus, so that ready reference may be made, if wanted, to the detailed history records, and the total number can be ascertained at a glance, for publication in the hospital report.

A concise table of operations may or may not be added as desired, but there should always be added a brief summary of the diagnosis and important points in each fatal case treated in the hospital during the year, with pathological report in all cases in which an autopsy was obtained.

This would afford a clear, concise record of the amount and character of the work done by the hospital staff, with the data easily accessible for anyone desiring more detailed information.

If, in a few words, reference were made to the present condition of certain classes treated in the preceding years, *e. g.* the present condition of the cancers of the breast, or of the hernias, which have appeared in the earlier tables, it would seem as if such a report, without taking up as much printed space, would afford a much better idea of the hospital efficiency than can be gained from the old tables, from which all that we have is, that the patients were discharged cured, relieved, not relieved, not treated, dead.

Although all the details of adapting this plan,

SURGICAL DISEASES TREATED.

ANATOMICAL CLASSIFICATION.	New Growths—Malignant		New Growths—Benign		Inflammatory—Acute		Inflammatory—Tuberculous		Inflammatory—Syphilitic		Inflammatory—Special Infections		Malformations and Deformities—Congenital		Malformations and Deformities—Acquired		Traumatic—Fractures and Dislocations		Traumatic—Wounds and Gangrene		Traumatic—Hernia		Other Traumatic Conditions		Intoxications and Poisons		Foreign Bodies including Calculi		Diseases due to animal parasites		Conditions pertaining to Pregnancy		Vascularities (Hemorrhoids, Aneurysm, etc.)		Other Conditions—Unclassified		Totals			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Mouth, Tongue, Teeth, Salivary Glands.	2	3	4	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Pharynx, Tonsils, Naso-Pharynx, Oesophagus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Stomach, Pylorus, Duodenum.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Liver, Bile-passages, Pancreas.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Appendix.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Intestines except Duodenum, Rectum Anus, Peri-rectal Tissue.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Peritoneum, Omentum, Retro-peritoneal Tissue.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Blood, Arteries, Veins.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Heart, Pericardium.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Lymphatic Glands and Vessels, Spleen.	2	1	15	6	23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Brain, Meninges, Spinal Cord.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nerves, Diseases of Mind and Nervous Diseases of Unknown Origin.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nasal Cavity and Accessory Sinuses, Larynx, Trachea.	1	...	9	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchi, Lungs, Pleurae.	1	...	9	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kidneys, Ureters, Urinary Bladder.	1	1	5	6	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Female—Urethra, Vagina, Pelvic Floor.	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uterus and Ligaments.	19	54	2	33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubes and Ovaries.	5	18	23	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mammary Glands.	23	10	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Male—Penis, Prostate, Seminal Vesicles, Testes.	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eye and Ear.	...	...	35	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Skin, Hair, Nails, Glands of Skin.	2	3	5	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thyroid, Para-thyroid, Thymus, Suprarenal, Pituitary.	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bones, Cartilages, Joints.	7	3	8	18	19	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Connective Tissue, Muscles, Tendons, Bursae, Fat.	1	7	14	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
General Systemic Infections.	...	...	2	1	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

especially to the work of the medical department, have not yet been worked out, we believe that it is capable of being made a practical working basis for a uniform hospital report that shall be at once simple, economical and illuminating; and we recommend that further study be undertaken to see if it can be satisfactorily adapted to the large metropolitan, as well as to the small private community hospital.

Your Committee further suggests that the problems of hospital records, end results, and general hospital administration, are of such vital interest to the pro-

fession and to the public that their consideration might profitably occupy a more prominent part in the Society's proceedings.

We believe that a special section devoted to these subjects would attract wide attention and be productive of valuable results in increasing the efficiency of the hospitals of the State.

HOMER GAGE, *Chairman*,
P. P. JOHNSON,
P. E. TRUESDALE,
LINCOLN DAVIS.

The Boston Medical and Surgical Journal

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Massachusetts Medical Society.

THE SHATTUCK LECTURE.*

THE ETIOLOGY OF THE DISEASES OF THE CIRCULATORY SYSTEM.

By THEODORE C. JANEWAY, M.D., BALTIMORE.

I THINK you will all agree with me that any existing classification of the diseases of the circulatory system leaves much to be desired. Writing of the best-elucidated form, acute endocarditis, Osler says,¹ "A good working classification, either etiological, anatomical, or clinical, is not easy to make." Turn the pages of any work on circulatory disease, to the affections of the myocardium, the so-called functional diseases of the heart, the diseases of the arteries, and you will search in vain for any single guiding principle in the arrangement of the great mass of facts accumulated by pathologists and clinicians.

I am not here to essay the impossible, to construct a single classification which shall embrace all of the diverse disturbances which may affect the circulatory system, or the equally impossible task of holding your attention for an hour while I do it. Every classification is tentative and temporary, but it has one definite object which cannot be achieved without it, the study of all the facts from a single point of view. The body is, to the anatomist, a complex of structures built up of tissues and their constituent cells; to

the physiologist, of mechanisms and organs accomplishing transformations of energy by physical and chemical means. In the study of disease, the anatomically-minded pathologist considers lesions fundamental, the physiologically-inclined, their effect on function. The clinician needs both points of view, and neglects either to his peril. Diagnosis has its historic roots in pathological anatomy, and if they are cut, the tree dies; but the fruits of diagnosis, which are for the healing of the sick man's symptoms, grow on the many branches of exact functional study.

The student of disease faces another problem which does not exist for the investigator of the healthy organism, the ultimate problem of causation. Whence come these diseases, and why? What are their primary, and what their accessory causes? How do they reach their baneful development? On the finding of the right answers to these questions depends the final attainment of the goal of our profession, the prevention of disease. By as much as the proverbial value of prevention exceeds that of cure, does the importance of study of the causes of disease surpass that of its manifestations, its results, or its treatment. Clinical classifications should, therefore, be etiological whenever possible, to emphasize above all things the point of attack upon disease.

Every recent study of vital statistics has indicated clearly that the remarkable lowering of the general death rate during the past forty years has depended upon control of the acute infectious diseases and the lessening of deaths among children and young adults. While this

* Delivered before The Massachusetts Medical Society, June 6, 1916.

has been in part the indirect result of improved living conditions, none will dispute the rôle which modern bacteriology and the discovery of the causes and modes of transmission of many of the infectious diseases has played in the achievement. On the other hand, sanitarians are now alive to the fact that the death rate for the age periods above forty has actually increased. This is brought out clearly in a comparison of the vital statistics of New York City for the years 1879-1881 and 1909-1911, compiled by Guilfoyle.² While the child under five has an increased expectancy of life of 10.6 years now, as compared with thirty years previously, the adult at forty has a diminished expectancy of 0.5 years, and the aged live, on the average, 3.3 years less. Dublin,³ studying the entire registration area of the United States, has shown an increased mortality from the age of fifty-five up in 1911 as compared with 1900. He has further proved clearly, as has Bolduan⁴ from New York City, that the increase is due in the main to diseases of the heart, arteries and kidneys, and to cancer.

*TABLE I.—DEATH-RATE PER 100,000 OF POPULATION FOR CERTAIN CAUSES OF DEATH.—MALE AND FEMALE COMBINED.—(REGISTRATION STATES AS CONSTITUTED IN 1900.)

Cause of Death.	1900	1910	Per Cent. Increase.
1. Cancer (all forms).....	63.5	82.9	30.6
2. Diabetes	11.0	17.6	60.0
3. Cerebral hemorrhage and apoplexy	72.5	86.1	18.8
4. Organic diseases of the heart	116.0	161.6	39.3
5. Diseases of arteries.....	5.2	25.8	396.2
6. Cirrhosis of liver.....	12.6	14.4	14.3
7. Bright's disease.....	81.0	95.7	18.1
Total.....	361.8	484.1	33.8

That diseases of the arteries have increased 396 per cent. in ten years seems to me impossible on its face. Those ten years witnessed the general adoption of blood pressure instruments by the practitioners of the United States. They also witnessed one of those extraordinary changes in diagnostic nomenclature comparable only to the revolutions in feminine fashions, which has made arteriosclerosis one of the most popular causes of death, and a diagnosis which any newspaper reporter considers a complete and satisfying explanation. With all such deductions, however, the statistics brought forward by Bolduan⁴ from American sources show a definitely increased incidence of diseases of the circulatory system. The significance of the figures would be much more serious had the population remained homogeneous during this period. The influx of immigrants from the South European countries, however, introduces so large a variable, that all the facts of racial, social and industrial predisposition to circulatory disease, and of the difference in the age-distribution of the population would have to be worked out with

great care before determining the actual increase of these diseases for any single racial stock, such as the native American of Anglo-Saxon origin, the Scandinavian, the North German or the Irish, which were the predominant stocks thirty years ago.

However men may differ as to details of interpretation, there can be only agreement as to the vast importance of the prevention of diseases which are responsible for approximately twenty-two per cent. of all the deaths in the United States. Public health officers⁴ and insurance companies⁵ are alike crying for the inauguration of a campaign against these diseases; but no campaign is justified because of the need for attaining an object unless the means for attaining that object are known and are available. Do we possess sufficient exact knowledge of the ultimate and the contributory causes of any of the diseases of the circulatory system to warrant widespread efforts to reduce their prevalence, or public propaganda for the dissemination of such useful knowledge? It is the attempt to answer these questions which has impelled me to bring before you this evening a sketch of the diseases of the circulatory system viewed from the standpoint of their etiology.

1. KNOWN BACTERIAL INFECTIONS.

(a) *Bacterial or septic endocarditis.*

The nature of the etiological agents has been more completely demonstrated for bacterial endocarditis than for any other lesion of the circulatory system. Post-mortem and clinical studies, and especially the blood culture studies of Lenhartz⁶ and his pupils, Libman and Celler,⁷ Horder⁸ and others, have put the classification of this type of circulatory disease permanently upon an etiological basis, and have made its diagnosis possible wherever bacteriological blood examination is available. The acuter types due to haemolytic streptococci, the staphylococci, the pneumococci, occasionally the gonococcus or rarer organisms, are important rather as a special group of the septic diseases than as diseases of the circulatory system. They are uniformly fatal, and do not lead to chronic valvular disease. Their prevention is merely a small part of the large problem of prevention of sepsis. From the standpoint of the circulatory system, the chronic form of bacterial endocarditis due to attenuated streptococci is assuming constantly greater prominence. Not only may patients with such an infection survive for several years and present the evidences of valvular disease combined with mild symptoms of general infection, but the observations of Harbitz, Libman and others⁹ have shown the possibility of healing of the lesions with disappearance of the bacteria. Infection by the attenuated coccus, now most commonly known as streptococcus viridans, has thus become one of the possible causes of chronic valvular disease of the heart. Improved methods of blood culture, such as have

¹ BOSTON, U. S. A. JUNE 29, 1916. HEALTH COMMISSIONER.

been devised by Rosenow,¹⁰ have recently, in the hands of some workers, led to reports of the frequent detection of these organisms in cases of apparent benign endocarditis ending in recovery, with a permanent valvular defect. Oille, Graham and Detweiler¹¹ report so many positive findings that they have propounded the view that similar organisms are responsible for the common form of benign endocarditis. This I shall recur to later. So far as the general experience of clinical bacteriologists may be relied upon, proved bacterial endocarditis is one of the rare causes of chronic valvular disease.

Problems awaiting solution in this field concern the portal of entry for these bacteria and the conditions predisposing to their lodgment on or in the heart valves. These attenuated streptococci are present in the majority of normal mouths, are frequent inhabitants of the tonsil, of the intestinal tract, of abscesses about the roots of the teeth. Their discovery in these situations makes the theory that here is their portal of entry altogether plausible. Practice has not lagged behind theory, and physicians, laryngologists and dentists are now doing their best to eradicate them at all such possible portals. It is as yet too soon to form any estimate of the value of such measures. Certainly, once the infection of a heart valve has occurred, removal of the source of the infection is likely to be of little benefit. I have had a number of disappointing results from the attempted prophylactic removal of infected tonsils. I feel that it would be well, for a number of years, to have infected tonsils removed; that abscesses about the teeth should be evacuated for their own sake; that other known foci of infection should be cleaned up; but that one should preserve an open mind and wait, perhaps ten years, for the demonstration of the efficacy of these measures in the prophylaxis of bacterial endocarditis. The problem of the conditions predisposing to infection of a valve is of great interest, and the subject of active investigation at the moment, but no knowledge upon which action can be based is at hand.

(b) *Other bacterial infections of the circulatory system.*

Although we possess so much more detailed information about infections of the heart-valves that endocarditis seems incomparably the most frequent lesion of the circulatory system produced by the lodgment of bacteria, the other structures of the heart and the vessels may likewise suffer. In certain infections, lobar pneumonia especially, acute pericarditis occurs more frequently than endocarditis. As a cause of eventual cardiac disease, however, pericarditis does not seem to play a particularly important rôle.

Acute inflammatory changes in the myocardium, and even abscesses of the heart-wall, are observed at the autopsy-table in cases of sepsis. It must be exceptional that these are recovered from with the production of chronic lesions.

In bacterial endocarditis infected emboli may give rise to lesions of distant arteries, which develop into aneurysms. Very commonly, in the case of the streptococcus viridans, small emboli produce a now well-recognized lesion of the glomerular tuft in the kidney. This type of focal nephritis, however, does not appear to be associated with hypertension and secondary cardiovascular changes. The acute inflammations of the arteries have been the subject of much study since the original publication of Virchow¹² in the first volume of his Archives. Your own Dr. Mallory¹³ has been a life-long advocate of the view that this is one of the important causes of chronic arterial disease. As with myocardial infection, so here the significance may best be discussed in the next section.

2. PROBABLE, BUT UNPROVED, BACTERIAL INFECTIONS.

(a) *The rheumatic infections.*

No fact in clinical medicine is better substantiated than the association of benign inflammations of the endocardium, pericardium and myocardium with that infection which we must still be content to call rheumatic. While to Bouillaud belongs the credit of the first thorough description of the rheumatic lesions of the heart and the introduction of the term endocarditis, in his book published in 1835, those of us who cherish Anglo-Saxon tradition may remember with pride that Piteairn, in 1788, taught his students about rheumatism of the heart in the wards of St. Bartholomew's Hospital; Matthew Baillie mentioned it in 1797 in the second edition of his famous "Morbidity Anatomy"; and William Charles Wells,¹⁴ in 1812, published an excellent series of case reports, including five with autopsies. For some unknown reason, possibly the failure carefully to observe the valves, pericarditis seems to have been disproportionately frequent during the earlier days of clinical and post-mortem study of the disease. At present it seems a very minor cause of circulatory death, the report of the Registrar-General for 1900¹⁵ showing during the previous deecennium 672 deaths from valvular disease in England, as against thirty-nine from pericarditis, calculated for one million living. The clear recognition of rheumatic myocarditis is of much more recent date, and due especially to the work of Krehl¹⁶ and Romberg.¹⁷

Despite the long years of study of acute rheumatic fever and the many who have felt convinced that they have discovered its causative organism, no one is entitled as yet to speak with positiveness as to its etiology. I confess to entire openmindedness toward the subject. I do not believe that the clinical similarity of many cases of acute arthritis due to attenuated streptococci proves that these organisms are therefore the cause of the vastly larger number of cases of acute rheumatic polyarthritis in which they cannot be demonstrated. All of the recent experi-

mental work has been undertaken with a view to establishing the causative relation of organisms of the streptococcus-pneumococcus group with rheumatic fever. The recent work of Faber,¹⁸ following up the earlier work of Loeffler, Cole and others, and his production of arthritis in sensitized joints, demonstrates how similar lesions may be produced with remarkable uniformity. It would also seem to throw light on the well-known tendency of acute arthritis to relapse; nevertheless, it still remains possible that true acute rheumatic fever is produced by an entirely different infectious agent.

In addition to the problem of its true cause, there are other problems capable of solution, which may clear the way for a prophylaxis of rheumatic heart lesions. These concern the portal of entry, the conditions predisposing to infection in general and to its localization in the heart in particular. The weight of clinical evidence certainly tends strongly to incriminate the throat as the portal of entry. Attacks are very commonly the sequel, after one or two weeks, of a tonsillitis or infection of the pharyngeal mucous membrane. Tonsillectomy is already much in vogue as a prophylactic measure. My opinion as to its usefulness here is the same that I have already expressed with reference to known streptococcus infection. My experience has taught me that it is not a prophylactic panacea; I even have grave doubts as to its usefulness after the individual has suffered from an attack of rheumatic fever, but I do not allow these doubts to prevent the patient from receiving what benefit the operation may give. Only a large statistical study covering a number of years can provide a basis of solid fact for or against the removal of tonsils.

General conditions favoring infection are too well known to require more than passing comment. The most striking is youth. I doubt whether any of us would recommend its prophylactic removal if we could. The colder climates seem clearly to predispose, and the late winter and early spring months. These influences are most interestingly discussed by Sticker¹⁹ in his recent volume on diseases due to cold. No radical reduction in the amount of rheumatic infection seems likely to be achieved from anything short of the discovery of the portals of entry and how to close them, but I believe that children of families with known tendency to rheumatic infections may here and there be saved by us as individuals, if we give sufficient attention to these minor accessory causes. No theories concerning the cause of localization in the heart-valves have as yet led to practical results; neither the older ones, which laid stress on the mechanical factor, nor Rosenow's²⁰ ideas of organ specificity in the coccus.

(b) Benign endocarditis leading to chronic valvular disease is known to occur with considerable frequency in chorea, more rarely as a

sequel of scarlet fever and throat infections. Other clinical associations are too rare to be of practical significance. Definite knowledge as to the etiological organism is still scantier here than for rheumatic endocarditis, though a streptococcus is occasionally demonstrated, and is most open to suspicion of guilt.

(c) Acute infectious myocarditis is a term very loosely used. Whether in most instances definite bacterial infection of the heart muscle can be assumed is very questionable. Degenerative changes in the muscle probably occur in most severe infections, actual inflammatory lesions in some. Diphtheritic myocarditis, one of the most important clinical types, seems clearly a toxic degeneration with secondary inflammatory reaction. During typhoid fever and pneumonia, the various exanthemata, and sepsis, and following influenza, the evidence of myocardial disturbance may develop and demand serious attention. To what extent such acute infectious myocarditis is responsible for chronic myocardial disease later in life, is a much-debated question. That some of these patients show progressive heart-muscle weakness must be granted; that any clear connection can be traced between the bulk of our cases of primary myocardial insufficiency and a preceding acute myocarditis, must be denied. For even the best authenticated type, rheumatic myocarditis, opinions differ sharply as to the effect of the lesion upon the functional integrity of the heart-muscle. Krehl¹⁶ and Romberg¹⁷ attribute to it the eventual failure of compensation in the affected hearts, while Aschoff and Tawara²¹ hold that the scars left by the small focal lesions represent the destruction of so small a fraction of the heart-wall as to be without practical significance. Modern knowledge of such important specialized portions of the myocardium as the conducting system make it highly probable that even small scars may, in certain situations, lead to serious disturbances of rhythm. An excellent discussion of all the problems of acute and chronic myocarditis will be found in Krehl's classical work.²² While emphasizing the lack of finality of our knowledge, I would not be thought to minimize the fundamental importance of myocardial lesions.

(d) Acute arteritis and phlebitis present a still more difficult etiological problem, of which the limits of this paper do not permit a complete discussion. The former may easily be admitted as a cause of more or less localized chronic arterial lesions, embraced under the general category of arteriosclerosis. Nothing is more difficult to trace than the ultimate responsibility for this disease of late life, when the accidents, strains and infections of half a century, in addition to the inherited quality of the arterial tissues, elastic and muscular, all afford plausible and almost unverifiable explanations of its origin. The problem is scarcely possible of approach from the clinical side, because the diagnosis of sele-

rosis of the aorta and visceral arteries is highly fallible, and even the discrimination of true arteriosclerosis of the accessible peripheral vessels difficult. At the present moment it is the fashion to detect thickening of the radial artery in nearly every adult male, and to index this as arteriosclerosis in hospital records. It is also the rule to consider hypertension and arteriosclerosis as synonymous, a tendency I wish, with Allbutt,²³ to combat vigorously. One of the most careful clinical studies, that made by Thayer²⁴ of the vascular complications and sequelae of typhoid fever, showed that the radial arteries were far more frequently thickened, and the average systolic blood-pressure was higher in every decade, in patients with a history of previous typhoid fever. I have tabulated the histories of my series of hypertensive patients previously reported,²⁵ with reference to the incidence of past infections.

TABLE II.—HISTORY OF PAST INFECTIONS IN CASES OF HYPERTENSIVE CARDIO-VASCULAR DISEASE.

Infection.	Total Number Investigated.	Positive History.	
		No.	Per Cent.
Pyogenic infections, surgical, etc.	312	71	18.4
Typhoid fever.....	384	57	14.8
Pneumonia	379	49	12.9
Arthritis	374	46	12.3
Scarlet fever.....	377	37	9.8

The outstanding fact in this group is the frequency of typhoid fever compared with pneumonia. The mortality statistics for the whole registration area of the United States in 1913²⁶ give a death rate from typhoid of 17.9, and from pneumonia of 132.4. If one assumes a mortality of ten per cent. for the former and of thirty-three per cent. for the latter,—figures which certainly do not exaggerate the typhoid deaths,—the proportion of total cases would be, roughly, one of typhoid to three of pneumonia, a conservative figure. Yet more of my patients had passed through typhoid fever than through pneumonia. The relation is worthy of further critical study.

Faber²⁷ has studied this and all related questions exhaustively from the pathological side, and I would refer to his book for the collected facts and bibliography in this field, without entering upon further discussion of the effects of tuberculosis and other diseases. His conclusion is, that the greater the number of illnesses an individual has survived, the more arteriosclerosis he is likely to develop.

Periarteritis nodosa is a very rare acute or subacute inflammatory disease of the arteries. Its infectious agent is wholly unknown, but it is certainly not syphilitic, as frequently alleged.²⁸

3. SYPHILIS.

(a) Of the aorta.

Proof of the syphilitic nature of certain frequent and important types of cardio-vascular disease is a recent achievement. Suspicion has

long existed. Morgagni recognized the clinical association of aneurysm with syphilis, and Corrigan that of aortic insufficiency. Nevertheless, in spite of such occasional descriptions of syphilis-like lesions in the aorta as Heiberg's and Laveran's, and the important contribution by F. H. Welch²⁹ in 1875, showing the major rôle of syphilis in producing the aortic lesion leading to aneurysm, it remained for Doehle,³⁰ working under Heller in Kiel, to bring forward in 1885 a convincing histological study of the syphilitic lesion of the aorta. This was followed by a number of publications by Heller and his assistants. Even then it was not until a discussion before the German Pathological Society in 1903, by Chiari, Benda and Marchand, that the specific nature of the changes called syphilitic mesoarteritis was generally accepted, and this diagnosis began to appear regularly in autopsy protocols. The further proof was afforded by Reuter³¹ in 1906, who was able to identify the spirochetes in the aortic lesion. Important confirmation of this was brought forward by your own Drs. Wright and Richardson³² in 1909. The indirect evidence afforded by the Wassermann reaction has accumulated rapidly since the first study of Citron.³³ The clinical diagnosis of syphilis of the aorta, as you all know, has now attained a degree of certainty at least as great as that of any other of the diseases of the heart and vessels. For admirable descriptions of the pathological and clinical aspects of aortic syphilis, and bibliography, I would refer to Gruber's monograph,³⁴ Fordyce's Harvey Lecture,³⁵ the excellent papers of Longcope,^{36, 37} and Sir Clifford Allbutt's *magnum opus*,²³ among a host of others.

It is sufficient here to remind you of certain clinically important facts. Syphilis is a disease of the thoracic aorta, almost invariably stopping above the origin of the coeliac axis, and only rarely extending beyond the arch. The lesions are most marked at the root of the aorta, and, in a large proportion of the cases, involve the aortic cusps, producing an aortic insufficiency. Longcope³⁶ estimates that seventy-five per cent. of all aortic insufficiency in adults is due to syphilis. Aneurysm is the most serious result of the weakening of the aortic wall. This occurred in 24 of 120 cases of syphilis of the aorta studied post-mortem by Gruber,³⁴ in 48 of 248 patients observed by Stadler,³⁸ and in thirty per cent. of Symmers and Wallace's³⁹ seventy autopsies. Some dilatation of the aorta can be detected in practically every case examined roentgenologically. The relative frequency of syphilis of the aorta and other syphilitic lesions in the Johns Hopkins Hospital may be found in Tables III and IV.

(b) Of the heart.

In addition to syphilis of the aorta, actual syphilitic lesions of the heart-wall are clearly recognized. True gummata admit of no dis-

pute, but are manifestly rare. My impression, gained from reported cases and from my personal experience, is that their chief clinical importance lies in their frequent association with heart-block. As a cause of any other type of circulatory disturbance, gumma of the heart is insignificant. The relation of syphilitic infection to other myocardial lesions is a matter about which, at present, it is most difficult to speak with positiveness. None of these diffuse lesions is histologically specific for syphilis. There seems little question that a chronic fibroid myocarditis may result from the healing of gummata of the heart-wall, or, as a more diffuse process, may occur through the lodgment of the *treponema pallidum* without true gumma formation. Warthin⁴⁰ has described the finding of the organism in a large series of hearts of individuals dying not only with congenital, but also with acquired, syphilis. Associated with them were many different parenchymatous and interstitial lesions, and at times no obvious lesion whatever. Krehl²² is of the opinion that syphilis is an important factor in the production of chronic myocardial disease, but actual demonstration is certainly lacking. The differential diagnosis from other types of myocardial damage is rarely possible, and I am quite convinced that it is not justified merely by the finding of a positive Wassermann reaction in a patient with myocardial insufficiency.

Narrowing of the mouths of the coronary arteries by syphilitic lesions of the root of the aorta is a not infrequent cause both of myocardial changes and of eventual cardiac death. Angina pectoris, whether we believe it dependent upon coronary narrowing, or, with Allbutt,²³ as due to the actual inflammation of the aorta, has a high incidence as a symptom in aortic syphilis.

Syphilis of the endocardium and pericardium is negligible.

(c) *Of the smaller arteries.*

The recognition of syphilitic lesions in the smaller arteries began with Virchow's first paper, already alluded to.¹² The history of the development of opinion in this field will be found in Allbutt's book,²³ presented by one who has made many contributions to its growth, and who was one of its earliest students. Syphilitic disease of the cerebral arteries, first thoroughly described by Heubner,⁴¹ is, from the clinical standpoint, the most clearly recognizable type. It leads to such obvious and serious effects within a comparatively small number of years after the primary infection that the sequence is obvious. The majority of attacks of hemiplegia in young individuals are certainly syphilitic in origin.

About disease of the smaller arteries elsewhere in the body it is much more difficult to form an opinion. Current teaching, surely well represented by Osler,⁴² makes syphilis "one of the most important single causes." This, how-

ever, is usually due to the inclusion of syphilis of the aorta in the general category of arteriosclerosis, a practice which should be abandoned. In a recent article Riesman⁴³ says, "Taking arteriosclerosis cases by and large, I may say that syphilis is the most frequent cause of the uncomplicated type of the disease." But arteriosclerosis almost inevitably involves many complications, and he is certainly confusing arteriosclerosis with essential hypertension. Mott,⁴⁴ in a compendious discussion, speaks of syphilis as affecting the arteries generally, but gives specific facts only for the aorta, coronary and cerebral arteries, and in rare cases the pulmonary. Herxheimer's authoritative review⁴⁵ shows the occasional report of true syphilis of the larger peripheral arteries, and of widespread arterial lesions, but these belong to the exceptions. No facts have yet been brought forward to prove that syphilis is of more importance than other chronic infectious diseases in the etiology of ordinary arteriosclerosis.

Recently Stoll⁴⁶ has published interesting observations on the rôle of syphilis in hypertensive cardio-vascular disease. He has made the suggestion, of great importance if it can be confirmed, that the well-known cardio-vascular heredity is "familial cardio-vascular syphilis." He has shown how much more frequently a syphilitic taint, affecting several members of a family, may be detected, if the possibility be in mind, and both the patient and his family be investigated with intelligence. On the other hand, much of his argument rests upon the validity of Noguchi's luetin test as evidence of otherwise latent syphilis. This has already been seriously questioned by Sherriek,⁴⁷ who showed the remarkable effect of potassium iodide in producing a positive reaction. Sherriek's results have been confirmed in a series of cases this winter by Rivers in our clinic, which will appear later. He has demonstrated to our satisfaction that the test has no diagnostic value in any patient that is receiving iodide.

The whole matter has seemed to me of such significance that I have made it the subject of a special study of the medical patients of the Johns Hopkins Hospital between September 21, 1914, and April 2, 1916. For assistance in this I have to thank the members of my staff in general, and Dr. Mary A. Hodge and my secretary, Miss Lauer, in particular.

While the chief significance of these figures is clear, certain comments are necessary. The relation of white and colored populations in Baltimore, as given by the United States Census of 1910, was 84.8% white to 15.2% colored. This is practically identical with the proportion of white and colored patients in the hospital, and the morbidity rates of the hospital should, therefore, be comparable with the registered deaths of the city as a whole. On the other hand, it must be remembered that the white patients of the hospital, including, as they do, a number of

TABLE III.—INCIDENCE OF CERTAIN DISEASES OF THE CIRCULATORY SYSTEM AND OF WASSERMANN REACTIONS IN PATIENTS OF THE MEDICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL, SEPT. 21, 1914, TO APR. 2, 1916.

	WHITE		COLORED		TOTAL
	No.	Per Cent.	No.	Per Cent.	
1. Admissions.....	2029	85.4	347	14.6	2376
2. Individuals.....	1884	85.1	329	14.9	2213
3. Patients having Wassermann reaction done.....	1272	....	288	....	1560
4. Patients with W. R. positive.....	166	....	124	....	290
Per cent. of 2.....	....	8.8	....	37.6	....
Per cent. of 3.....	....	13.	....	43.	....
5. Syphilis of aorta:					
Per cent. of 2.....	31	1.6	50	17.4	81
W. R. positive.....	25	....	47	....	72
W. R. negative (aneurysm*).....	6	19.3	3	6.	9
6. Other aortic lesions†:					
Per cent. of 2.....	21	1.1	6	1.8	27
Dilated aortic arch.....	14	....	4	....	18
Aortic insufficiency.....	7	....	2	....	9
7. Chronic endocarditis, all valves. Per cent. of 2.....	45	2.4	7	2.1	52
8. Hypertension, all cases:					
Per cent. of 2.....	250	13.7	70	21.2	320
W. R. done.....	230	....	69	....	299
W. R. positive.....	8	....	22	....	30
Per cent. of W. R. cases.....	....	3.5	....	31.9	....
Per cent. of all cases.....	....	3.2	....	31.4	....
9. Myocardial insufficiency, all cases:					
Per cent. of 2.....	168	8.9	82	24.9	250
W. R. positive.....	17	10.1	30	36.6	47

* Cases of thoracic aneurysm, unquestionably syphilis of aorta. This represents the minimum of negative reactions in syphilis of aorta. A study of the reaction in all cases going to autopsy saved from, by Dr. Mary A. Hodge, which will appear subsequently, shows approximately 70 per cent. positive and 30 per cent. negative Wassermann reactions at the Johns Hopkins Hospital for the entire period, in cases of proved syphilis of the aorta.

† Includes arteriosclerotic lesions, chronic endocarditis, etc. Probably includes cases of syphilis of aorta not clinically recognizable as such, in which no autopsy proof was available.

TABLE IV.—ANALYSIS OF CASES WITH POSITIVE WASSERMANN REACTION IN TABLE III.

Diagnosis.	White.	Colored.	Total.
Syphilis:			
Of aorta only.....	21	28	49
Of aorta and central nervous system.....	3	6	9
Of aorta and central nervous system; hypertension.....	..	1	1
Of aorta; other visceral, bone or skin lesions.....	..	2	2
Of aorta; chronic nephritis; hypertension.....	..	3	3
Of aorta; hypertension.....	1	7	8
Total of aorta.....	25	47	72
Of central nervous system only.....	86	7	93
Of central nervous system and aorta.....	3	6	9
Of central nervous system and aorta; hypertension.....	..	1	1
Of central nervous system; other visceral, bone or skin lesions.....	2	2	4
Of central nervous system; chronic nephritis; hypertension.....	..	3	3
Of central nervous system; hypertension.....	5	1	6
Total of central nervous system.....	96	20	116
Of heart; heart-block.....	..	1	
Of carotid, aneurysm.....	..	1	2
Deduct duplicates.....	3	7	10
Other localization only: visceral, bone, skin, etc.....	21	12	33
Total syphilitic lesions.....			213
No definite syphilitic lesions. Latent syphilis:			
Chronic nephritis; hypertension.....	1	5†	6‡
Hypertension.....	1	1	2
Diabetes.....	3	..	3
Pneumonia.....	3	9	12
Other acute and chronic diseases.....	19	35	54†
Total.....	27	50	77
Total positive Wassermann reactions.....	166	124	290

* Including two cases of possible syphilis of the myocardium.

† Including two cases of possible syphilis of the aorta.

TABLE V.—ANALYSIS OF 209 CASES OF HYPERTENSION IN TABLE III.

	WHITE.		COLORED.		TOTAL.
	No.	Per Cent.	No.	Per Cent.	
1. Evident renal involvement:					
Wassermann negative.....	121	....	26	....	147
Wassermann positive.....	1	0.8	11	29.7	12
Total	122		37		159
With syphilis of aorta or nervous system.....	1	....	6	....	7
Without discoverable syphilitic lesions.....	...	0.0	*5	13.5	*5
2. No evident renal involvement:					
Wassermann negative.....	101	....	21	....	122
Wassermann positive.....	7	6.5	11	34.4	18
Total	108		32		140
With syphilis of aorta or nervous system.....	6	....	10	....	16
Without discoverable syphilitic lesions.....	1	0.9	1	3.1	2

* Of these cases, two had possible syphilis of aorta.

private patients, come from a wide area, and frequently for diagnosis, rather than for the treatment of serious illness. They represent, therefore, a partially selected material, and the graver disorders of the circulation would thus tend to higher proportional representation in the colored wards. Furthermore, the racial division represents an industrial one as well, the colored race being the manual laborers. The total deaths and death-rates of Baltimore for 1913²⁶ were:

White	7912	16.2 per 1000
Colored	2712	31 per 1000

To bring out the relative importance of circulatory as contrasted with infectious diseases as a cause of death in the two races, I have made the following table from the recorded deaths of the Mortality Statistics,²⁶ pages 252 and 253.

TABLE VI.—DEATHS IN BALTIMORE, 1913, FROM CERTAIN IMPORTANT DISEASES.

Deaths from:	WHITE.		COLORED.	
	No.	Per Cent. of all White.	No.	Per Cent. of all Colored.
Tuberculosis (lungs).....	742	9.4	452	16.7
Pneumonia	780	9.8	393	14.5
Bright's disease.....	801	10.1	234	8.6
Organic heart.....	706	8.9	268	9.9
Cerebral hemorrhage, etc.	440	5.5	102	3.7
Cancer	510	6.4	91	3.3

For the city as a whole, therefore, a larger proportion of all white persons die of diseases of the heart, arteries and kidneys, than of colored persons. Our hospital figures must then be due to selection of material, the colored patients seeking the hospital only when unable to work. In addition, the number of negroes living at the higher age period of circulatory disease is probably less.

That the colored patients suffer from syphilis of the aorta ten times as frequently as the white, cannot be due wholly to selection. Should this fact, and the finding of a positive Wassermann reaction in approximately forty per cent.

of the colored patients, be interpreted as demonstrating so extensive a syphilization of the colored race in our cities? I think not without deductions. Clearly my figures are interdependent. The proportion of patients with positive Wassermann reaction is more than a third due to the presence of the patients with aortic syphilis. The negro, being a manual laborer, may, and I believe does, have a greater liability to the development of aortic lesions, and especially of aneurysm, if he contracts syphilis. A recent article by Boas⁴⁶ discusses the prevalence of syphilis in the two races and faces the same difficulties of interpreting hospital statistics, finally concluding that syphilis is from one and a half to two and a half times more frequent in negroes, but that its frequency in them, sometimes estimated at 75%, has been grossly exaggerated.

From another point of view, the great preponderance of tuberculosis and pneumonia as causes of death in the negroes, and their low cancer rate, argue against the predominant influence of syphilis. Grotjahn⁴⁶ cites the experience of the Gotha Life Insurance Company with syphilitics as follows: The mortality from all causes was 68% above that of all insured. The deaths among them were higher by 10% from infectious diseases, 60% from malignant growths, 64% from kidney disease, 116% from cardio-vascular disease, 128% from apoplexy, and 145% from mental diseases, exclusive of paresis. A comparison of these figures with mine shows that racial susceptibility must play at least as important a rôle as syphilis in determining morbidity among the negroes of Baltimore.

When we turn to the particular question of the rôle of syphilis in hypertensive cardio-vascular disease in the white race, the very low percentage of positive Wassermann reactions, at the most 3.5%, compared with the figure for the whole number of white patients, 8.8%, seems to

give an effectual answer in the negative. This is in accord with the experience of Walker and Haller⁵⁰ at the Peter Bent Brigham Hospital.

The only argument possible is from the greater frequency of this type of circulatory disease in the colored wards. Even here the proportion of positive Wassermann reactions is less than the average for these wards. If we turn to Table V, where I have shown the combination of hypertension and syphilis of the aorta or central nervous system, there remain, after deducting such cases, only 13.5% of the cases with renal involvement, and 3.1% of those without, whose positive Wassermann reactions could not be explained by obvious syphilis elsewhere.

My private cases are unsatisfactory as evidence, since they were, for the most part, before the days of Wassermann reactions. Of the more than 400 patients, only 23 gave a history of syphilis. This merely indicates the difference between hypertension and such diseases as tabes, long known to be related to syphilis because of the frequency of a syphilitic history, and called para-syphilitic until modern investigation proved their true nature. Our predecessors never included cardio-renal disease among the para-syphilitic manifestations.

My conclusion is, that no evidence has been brought forward to place hypertensive cardiovascular disease in the category of the direct results of syphilis, and that syphilis plays an indirect rôle, if any, in its causation.

4. RARE INFECTIONS.

Of the rarer infections of the circulatory system, tuberculosis alone deserves consideration. Tuberculous pericarditis may occur as a clinically primary disease. Other tuberculous lesions of the heart are of purely pathological interest.

5. PARASITES AND TUMORS.

Parasites and tumors, involving the heart or large vessels, need be mentioned merely for the sake of completeness. They may delight the custodian of a pathological museum, but not the practitioner or the sanitarian.

6. INTOXICATIONS.

(a) *Erogenous.*

It is difficult to form any just estimate of the part played by poisons in the etiology of cardiovascular disease. Unlike the nervous system, where the various metallic poisons each produce specific types of disease, due to selective action on different structures, no definite types of circulatory disease can be distinguished as due to particular intoxications. Perhaps the nearest approach to this is the influence of lead on the arteries. In acute lead poisoning, with the colic, there is regularly vascular spasm and hypertension. In chronic plumbism, I have occasionally seen the picture of hypertensive cardiovascular disease, with arteriosclerosis, and I am

personally convinced that lead is one of the rarer, but most definite, causes of it.

The rôle of alcohol in the production of disease of heart or vessels is a burning question of the day. There can be no doubt that the death-rate from circulatory disease is considerably higher in those occupations where habitual drinking is the rule, as the statistics of Sendtner⁵¹ for Munich show. In 1889 the death-rate from heart diseases was 11% for all adult males, 21% for male, and 19% for female innkeepers, and 16% for brewery employees. On the other hand, Tatham,⁵² in studying the death-rate of various classes employed in the manufacture and sale of liquor in England and Wales, found a similar greater incidence of circulatory death, but also an increased rate from diseases of other systems, from tuberculosis and influenza, from many other conditions, and from all causes combined. The deleterious effects of habitual drinking are obvious. The specific effect of alcohol, apart from other associated harmful influences, upon heart or vessels, I am not prepared to express any opinion about.

The most commonly assumed example is the so-called "Munich or Tübingen beer heart." But in this, excessive muscular work and the consumption of large quantities of fluid surely so complicate the interpretation as to leave the influence of the alcohol beyond computation.

Alcohol is frequently assumed to be one of the important causes of arteriosclerosis and its associated cardio-vascular disturbances. Allbutt⁵³ (page 246), reviewing the evidence, including the valuable negative findings of Richard Cabot,⁵⁴ concludes that alcohol is not "a cause in eminent domain," but acts as the ally of other poisons. Faber⁵⁵ believes it exerts a deleterious influence on the vessels directly as well as indirectly. A study of my own private cases showing hypertension lends no support to the view that alcohol has an important influence in the production of this type of arterial disease. Of 397 patients whose histories as to alcohol were known, 37.5% were total abstainers; 31.5% took alcohol only occasionally in small amount; 18.1% were habitual temperate drinkers, that is, never using more than three drinks a day; those who regularly or occasionally used alcohol in excessive amounts made but 12.9% of the total.

Coffee and tea are commonly used poisons, perhaps less commonly abused than formerly. That they may lead to disturbance of the heart's rhythm, to vaso-motor disorders and to marked subjective symptoms is well known. It is possible that permanent lesions in the heart muscle may follow, but evidence is very difficult to obtain.

Tobacco is equally known to produce marked disorders of cardiac rhythm, especially extrasystoles, and in some individuals smoking will raise the blood-pressure. The tobacco-heart is, in the popular mind, a well-defined etiological

type of circulatory disease. Krehl²² believes in a toxic angina pectoris due to tobacco misuse. I have seen cases which impressed me as such. Allbutt²³ and Osler²⁴ think it rare. In order to obtain concrete facts on which to base an opinion, I have tabulated the histories as to tobacco of 226 men with anginoid pain, seen by my father or myself, and, as a comparison, of 285 men with hypertension, and of 300 other male patients. Certainly no important influence of tobacco can be seen in these figures.

Plummer²⁵ has brought forward interesting evidence of the association of hypertension with old goitres of his so-called non-hyperplastic type. Eighteen per cent. of such patients studied by him, who were more than forty years of age, showed a systolic blood pressure of above 160. Looked at from the other point of view, a survey of 423 of my hypertensive patients, with reference to this point, showed only two with goitre associated with some toxic symptoms, in all less than 2%. In the same

TABLE VII.—THE USE OF TOBACCO IN MEN WITH HYPERTENSION OR ANGINA PECTORIS, AND IN ALL OTHER MEN.

	HYPERTENSION.		ANGINA PECTORIS.		OTHER PATIENTS.	
	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
No tobacco.....	59	20.1	49	21.7	80	26.7
Not over three cigars a day.....	101	36.	60	26.5	78	26.
Four to six cigars.....	76	26.7	63	27.9	69	23.
Over six cigars.....	49	17.2	54	23.9	73	24.3
Total	285	100.0	226	100.0	300	100.0

I have been struck with the frequency of temporary discomforting palpitation, with extrasystolic irregularities in physicians, following the excessive use of coffee and tobacco during periods of extreme overwork, the symptoms all disappearing with the resumption of temperate habits. I have seen auricular fibrillation supervene.

It is safe to say, therefore, that toxic cardiac and vaso-motor disturbances are well authenticated; that they are evidenced for the most part by disorders of rhythm, and are attended by striking subjective symptoms; that they may lead to chronic myocardial disease is a plausible hypothesis, which can neither be affirmed nor denied in the present state of our knowledge; that they may lead to chronic arterial disease is at present still more conjectural.

(b) *Endogenous.*

The most striking and best known example of circulatory disease due to an intoxication, arising from the perverted activity of an organ of internal secretion, is the cardiac disorder of exophthalmic goitre. In its milder forms or its earlier stages, characterized merely by an exaggerated cardiac activity with increased rate and a tendency to peripheral vaso-dilatation, it leads, in its graver forms, to severe, and even fatal, myocardial insufficiency, with extrasystolic arrhythmia or eventual fibrillation of the auricles. Thyroid intoxication is, therefore, a clear cause of a definite type of circulatory disease, and one may with justice speak of a thyreotoxic cardiopathy if one wishes to think in etiologically exact, though somewhat pedantic, categories. A somewhat similar, though less adequately differentiated type of cardiac disturbance, is seen in association with uterine myomata, the so-called "Myomherz" of the German writers.

group were 12 with myomata, out of a total of 151 women, nearly 8%.

The last twelve years have seen numerous attempts to connect permanent hypertension with over-function of the adrenal gland. The hypothesis is a most attractive one, the indirect evidence for it considerable. The extreme antithesis of hypertensive cardio-vascular disease is seen in the vascular asthenia and hypotension of Addison's disease or following the experimental removal of both adrenals. Hypertension is regularly absent in chronic nephritis only in the peculiar type associated with general amyloidosis, and in this the adrenals are extensively infiltrated with amyloid. The blood sugar curve in patients with chronic nephritis has this winter been shown by Hamman²⁶ in our clinic to be very similar to that of diabetes, and not easily interpreted as mere renal retention. On the other hand, since I reviewed this whole subject in 1913²⁷ there has not been a single additional piece of direct evidence in support of the hypothesis. It remains, therefore, an interesting etiological speculation, still deserving of further experimental investigation, and nothing more.

The cause of arteriosclerosis and of hypertension is frequently sought in poisons having their origin in a deranged body-chemistry. Clinical observation has long associated arteriosclerosis with diabetes as a definite complication, and responsible for the not uncommon myocardial insufficiency of elderly diabetics through implication of the coronary arteries. Hypertension is also fairly common in diabetic patients. Of my 458 carefully-studied private patients with permanent high blood-pressure, 44, or 9.6% were diabetics. Of 320 hypertensive patients in the Johns Hopkins Hospital since September, 1914, 23, or 7.2%, were diabetics. The figures are equally convincing when computed for the incidence of arterial disease in diabetes. Beyond

the mere fact of clinical association, however, it is not possible to go. Whether the arterial disease is produced by the hyperglycemia or other chemical derangements of diabetes, or is dependent upon some phase of the disorder of the internal secretions which lies back of the diabetes, or bears some other relation of causation or coincidence, must be left for the future to determine.

Gout, especially in England, has been widely assumed to play an important rôle in the etiology of the disease which, from the standpoint of the cardio-vascular system, is called hypertension, with its resultant hypertrophied heart and arteries, from the standpoint of the kidney, chronic interstitial nephritis. In fact, the primary type of the latter is, in England, called the gouty kidney. It must be borne in mind that gout is a very common disease in London, and a comparatively rare one in this country. Of my private patients with hypertension, 22, of 423 in whom this fact was noted, either themselves had gout, or had a distinct family history of it. The maximum incidence of gout in the etiology of the disease in these patients was, therefore, 5.2%. Of the 320 hospital patients, only two had definite, and one other possible, gout. During the same period two patients with long-standing gout have died of other diseases, showing functionally normal kidneys during life and no chronic interstitial nephritis at autopsy. I do not, therefore, believe that a gouty nephritis or a gouty arterial disease can be recognized as an etiological type, but that gout may be reckoned among the predisposing factors favoring the influence of the real, but unknown, causes of these diseases.

The association of chronic renal disease and permanent hypertension leading to hypertrophy of the heart, to thickening of the larger arteries, and the eventual development of arteriosclerosis, terminating frequently in myocardial insufficiency or the rupture or occlusion of a cerebral artery, has been a commonplace of clinical and pathological observation since its first description by Richard Bright. It is one of the best-differentiated clinical types of circulatory disease, and one of the commonest. How should it be classified etiologically? The discussion of this problem alone would require more than the space of a single lecture, and would lead, at best, merely to a re-statement of conflicting hypotheses. If you will allow me to be a bit dogmatic in order that I may be decently laconic, I would say that only in the minority of cases should the disease be thought of as primarily renal, and the circulatory disorder as secondary thereto. Such a case as that described by Mann⁵⁸ shows how a primary scarlatinal nephritis may, after decades, result in secondary contracted kidney with true nephritic hypertension and hypertrophied heart, but these are very rare. Of 379 private patients investigated for this point, only 16, or 4.2%, of

those with hypertension had ever suffered from acute nephritis; and of the 320 hospital cases, but three gave such a history. Of these 320, 61 were assumed to have an inflammatory renal disease and indexed as chronic diffuse nephritis with hypertension. Among these were 21 women, four of whom had shown the symptoms of nephritis during preceding pregnancies, or 19%. From this figure and from experience in other cases coming to autopsy, I believe that pregnancy may safely be considered one of the causes of progressive renal disease leading to hypertension, whether through metabolic poisons or not, we lack any information. Of the true causes of most cases of chronic diffuse nephritis, I feel safe in asserting that we are almost wholly ignorant.

In the majority of patients with so-called cardiorenal disease, I am convinced that it is essentially a disease of the circulatory system, involving the kidney through its vascular apparatus, and sometimes sparing it entirely. The behavior of the blood-pressure in these patients, when seen early, strongly suggests that the hypertension is dependent upon an exaggerated vaso-constrictor irritability, and that the development of the lesion in the arterioles comes later. This is Allbutt's "hyperpiesia,"⁷²³ Huchard's "présclérose."⁷⁵⁹ Volhard and Fahr⁶⁰ speak of the whole disease as "benign essential hypertension." No name will be satisfactory until it rests upon an etiological basis. Allbutt's designation is merely hypertension in unfamiliar form. His assumption of true plethora, increased blood volume, has never been proved constant in these patients. Observations by Keith, Rowntree and Geraghty⁶¹ in our clinic failed to show it in any of the cases examined by their accurate method. Allbutt looks upon the disease as distinctly one of overfeeding. Of 301 of my private patients in whom this could be ascertained, 126, or 41.8%, committed dietary excesses. The remainder were entirely temperate eaters. The figure, however, is not without significance. The frequency of the disease in our colored wards, however, shows that the overfed have no monopoly of it. Were I here to speculate, I would venture the opinion that a chronic intoxication will eventually be proved underlying this condition; but whether the poison originates in disturbed metabolism, in deranged or excessive function of a gland of internal secretion, or otherwise, I should not even hazard a guess.

7. NUTRITIONAL DISTURBANCES.

In this category come the brown atrophy of the heart seen in so many wasting diseases, which is clinically but part and parcel of the underlying disease, and the much more important effects of anemia upon the heart muscle. These are too well known to need more than passing comment. Their importance lies in the clear recognition that anemia entails definite

myocardial weakness and that safeguarding of the heart is necessary. From time to time severe grades of myocardial insufficiency develop as a definite result of anemia. On the other hand, it is necessary to bear in mind that the cardiac murmurs which occur in such hearts indicate only the temporary weakening of the heart muscle, and not permanent damage to the valves.

It is quite likely that the myocardial insufficiency, affecting chiefly the right heart, which accompanies beri-beri and scurvy should be considered nutritional in origin. In addition, the minor evidences of muscular exhaustion, to use Mackenzie's phrase, seen in women after prolonged lactation and too frequent child-bearing, are probably of this nature.

Viewed from the standpoint of the heart alone, the local nutritional disturbance resulting from narrowing of the coronary arteries ranks high among the causes of fatal cardiac disease in the elderly. From the standpoint of general circulatory etiology, however, it belongs with the rest of arteriosclerosis, and not in the category of nutritional disorders.

Obesity is not without influence upon the cardio-vascular system. It is not uncommon in the anamnesis of patients with hypertension, 15.7% of my patients, and 29.3% of my hospital patients exhibiting it. On the other hand, it must be borne in mind that these patients come from the age-periods in which obesity is common. Mr. Frederick L. Hoffman, statistician of the Prudential Insurance Company, has kindly furnished me with estimated figures for the United States, showing that above forty, 22 to 24% of the males, and 26 to 28% of the females are 10% or more above the average in weight.

That the obese often suffer from myocardial insufficiency is well known. This clinical association should be thought of as the weak heart of the fat rather than as the fatty heart. Two elements probably enter into it,—an actual impairment of the heart muscle, and the effect of the permanent increase in cardiac load.

8. MECHANICAL DISORDERS.

In this category I would embrace all those circulatory disorders which have their origin in increased demands upon the circulation, that is, the structural alterations resulting from overwork. The clearest examples of this are seen in those patients who develop a hypertrophied right ventricle as a result of alterations in the pulmonary circulation produced by emphysema, chronic fibroid tuberculosis of the lungs or extreme kyphosis. Many of these patients die a cardiac death from the eventual failure of the hypertrophied right ventricle to meet the constantly growing demands. The analogous condition for the left heart is myocardial failure consecutive on permanent hypertension. But, as I have already said, the fun-

damental disease is usually circulatory, and its etiology must therefore be carried back one step farther, to the cause of the hypertension. From the standpoint of the heart, however, it is an overwork disease.

The question of so-called acute dilatation, over-strain of a sound heart from excessive muscular work, has been much debated, and must still be considered open to argument. Heart muscle and skeletal muscles may usually be assumed to develop in balanced proportion, so that the latter cannot demand of the former more than it is capable of, unless it be diseased. The otherwise unexplainable myocardial failure seen in men doing heavy manual labor, and usually drinking large quantities of fluid, may well be considered an overwork disease. I have seen a number of such patients with marked hypertrophy and dilatation of the heart at autopsy, who had only chronic passive congestion of the kidneys, and whose blood-pressure was normal during life. This is the so-called "beer heart" of the Germans, but beer is neither a necessary element in its causation nor an adequate term for its etiological classification. In the same category, I believe, the so-called polycythemia hypertonica of Geisböck⁶² should be placed.

Can we affirm a similar pathological change in the arteries arising from overstrain? This has long been a vexed question. George Johnson⁶³ ascribed the thickened arteries so common in hypertensive patients to hypertrophy of the media. Allbutt²³ looks on the eventual development of arteriosclerosis in hypertension, his hyperpiesia, as the result of strain; and Adams⁶⁴ believes strongly in mechanical strain as a cause of fibrosis, and even the Mönckeberg arteriosclerosis. Thoma's⁶⁵ mechanical theories of arteriosclerosis are well known, and Jores⁶⁶ admits the probability that hypertension precedes the development of the elastic and intimal lesions in the arterioles. It is clear to me that Allbutt is right in his view that the diffusely thickened arteries of hypertensives are different from the beaded, calcified arteries of the aged, the former representing a compensatory reaction under stress, the latter a degenerative process. His designations for these two types of arteriosclerosis, hyperpietic and deerescent, represent a real attempt at etiological classification, though the names are not likely to become popular. Faber⁶⁷ unites both types in his view that arteriosclerosis arises from a disproportion between the strength of the vessel-wall and the blood-pressure. The mechanical factor is particularly clear in the cases of pulmonary arteriosclerosis associated with mitral stenosis. As a secondary factor, producing myocardial failure in a damaged heart or aneurysm in a weakened syphilitic aorta, mechanical strain plays a large part, often ushering in the final stage of circulatory disease. It probably determines the localization of arteriosclerotic changes in many in-

dividuals. Rombert⁶⁷ has said: "A man develops arteriosclerosis predominantly in the vascular areas which he has most taxed."

9. NERVOUS DISORDERS.

The list of nervous disturbances of the circulation, formerly long, has been wonderfully abridged by the newer physiology and its myogenic theory of the cardiac rhythm. There remain, as true nervous disturbances of the heart, only those more or less transient disorders of rate and rhythm due to influences reaching the heart through the extracardiac nerves, and the important part played by the higher nervous centers in determining the character of symptoms. Whether there are primary diseases of the vegetative nervous system with circulatory manifestations is not certain. Cannon and Fitz⁶⁸ recent work suggests the possibility that, back of the overactive thyroid in exophthalmic goitre, may lie a still more fundamental disorder of the sympathetic.

As to tonus disturbance from nervous influences we are still more in the dark. States of

local manifestation, is too firmly grounded in clinical observation to be without basis. Certain families show a striking preponderance of such deaths. Hypertensive arterial disease must be looked on today as the type in which heredity plays the largest rôle. Apart from such remarkable family histories as I could cite, however, my whole group of private patients gave the cause of death as cardio-vascular for both parents, or one parent and other members of the immediate family in 22%, for one parent or brother or sister in 28%, while 50% had no cardio-vascular heredity at all. Such figures suggest a subordinate and accessory influence of inheritance for the majority of patients.

12. RELATIVE IMPORTANCE OF THE VARIOUS CAUSES OF MYOCARDIAL INSUFFICIENCY.

Finally, I wish to call attention to the relative importance of some of the causes we have examined. For this purpose I have tabulated all the cases having myocardial insufficiency observed in our medical wards during the period already mentioned.

TABLE VIII.—ANALYSIS OF THE CAUSES OF MYOCARDIAL INSUFFICIENCY AND THEIR DISTRIBUTION BY RACE.

Total Patients, 1884.	WHITE.		COLORED.		TOTAL.	
	No.	Per Cent.	No.	Per Cent.	No.	Per Cent. of all cases.
1. Hypertension	56	62.2	34	37.7	90	26.
2. Chr. endocarditis (benign)	40	85.2	7	14.8	47	18.8
3. Syphilis of aorta	16	36.4	28	63.6	44	17.6
4. Primary myocardial disease (including coronary sclerosis)	23	76.7	7	23.3	30	12.
5. Chr. lung diseases (rt. heart insufficiency)	20	95.2	1	4.8	21	8.4
6. Bacterial endocarditis	8	88.9	1	11.1	9	3.6
7. Thyroid intoxication	3	50.	3	50.	6	2.4
8. Anemia	1	50.	1	50.	2	0.8
9. Syphilis of heart	...	0.0	1	100.	1	0.4
Total	167	66.8	83	33.2	250	100.0

vaso-motor instability, with local or general symptoms, are, of course, familiar; but only as clinical pictures without adequate explanation. Friedrich Müller⁶⁹ believes that nervous individuals are more prone to develop arteriosclerosis.

Cardiophobia, so frequent among medical students, is no circulatory disease, yet it should be borne in mind by all who plan propaganda for arousing the community to the dangers of circulatory disease. They must be prepared to treat it promptly and effectively.

10. DEFECTS OF DEVELOPMENT.

The various errors of development of the heart and great vessels make a chapter in cardiovascular pathology of fascinating interest to the embryologist, but afford no material for a campaign of prevention, and may be dismissed as a numerically infrequent cause of cardiac death.

11. HEREDITARY DISEASE.

The belief in an inherited quality of the arterial tissues with a tendency to premature death from apoplexy, angina pectoris, or other

The lesson of the table for preventive medicine in Baltimore is obvious. I trust it may be sufficiently valid for the Commonwealth of Massachusetts to fulfill the purpose of the founder of these lectures. One third of our myocardial failures are associated with hypertension. As another large group of these patients die of apoplexy, hypertensive cardio-vascular disease assumes first place as a cause of circulatory death. Chronic endocarditis stands next, with syphilis of the aorta just behind, each accounting for about one sixth of the failing hearts. If we could add the deaths due to syphilis of the cerebral arteries, and to ruptured aneurysms, the position of syphilis and of the other infections would be reversed. The clinically primary myocardial insufficiencies, a motley group etiologically, but largely arteriosclerotic, follow with about an eighth of the blame. Emphysema and its congeners are not far behind, then true bacterial endocarditis, then thyroid intoxication, and various minor causes.

CONCLUSIONS.

The following practical conclusions I believe are warranted:

I. Reduction of the mortality from circulatory diseases is attainable.

II. The measures now possible, which will yield definite results, are, in the order of their importance and feasibility:

1. The diminution of syphilitic infection and the early diagnosis and intensive treatment of primary syphilis.

2. The further reduction in preventable infectious diseases, especially diphtheria, scarlet fever and typhoid fever.

3. The education of the public to consider "rheumatism" a serious disease, particularly in childhood, and to seek competent medical advice at once; and the education of the medical profession to treat even the mildest rheumatic fever in bed with large doses of salicylates from the earliest possible moment.

4. The provision of convalescent hospitals for the necessarily protracted after-care of cases of acute inflammatory disease of the heart and of patients recovering from myocardial insufficiency.

5. The development of suitable employments for cardiac patients, and of the social and economic machinery necessary to placing them in such employments.

6. General hygienic measures, including the promotion of temperance.

7. The medical examination of the supposedly healthy at stated intervals.

III. No large reduction of the mortality from circulatory diseases is likely until two groups of problems have been solved:

1. The ultimate causes of hypertension and of chronic nephritis.

2. The infectious agent of rheumatic fever and its portal of entry.

IV. The solution of these problems, if of such a nature as to lead to practical measures, with the elimination of syphilis, would almost abolish disease of the circulatory system, except in the aged.

The need of the moment, therefore, is for more knowledge; not more knowledge of the dangers of circulatory diseases for the public, which means propaganda, but more knowledge of their causes for the physician, which means ceaseless investigation. May I close, in better words than I can master, with Tennyson's lines:

"Deliver not the tasks of might
To weakness, neither hide the ray
From those, not blind, who wait for day.
Though sitting girt with doubtful light.

"Not clinging to some ancient saw;
Not mastered by some modern term;
Not swift nor slow to change, but firm;
And in its season bring the law."

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STATE AND FEDERAL NARCOTIC LAWS.

THE Harrison anti-narcotic law has now been in operation for more than a year, but will have completed its first annual license period on June 30th. Members of the profession are urged to be prompt in registering and to use the utmost care in complying with all the provisions of the law. This year it will be necessary for an inventory to be made and properly sworn to, which inventory must be sent to the revenue collector, together with the application blank, also properly made out and sworn to.

There is no denying the fact that the provisions of this law entail a considerable amount of work; but we must admit that it was high time that some such law was enacted, and as the rock upon which our profession securely rests its foundation is service to our fellows, we should not only obey the letter of the law, but aid in its enforcement when called upon. It is a matter of regret that Congress did not have

the constitutional right to make this a police law, uniform through all the States and administered by federal officers. That was, however, impossible, because unconstitutional; but Congress did have the right to enact a revenue measure and to administer it. The Harrison law purports to be a revenue measure, but a slight study of the situation shows that it is not a revenue-producing act at all, nor was it ever intended to be such.

As a matter of fact, as soon as the Harrison law was in operation, practically all the States hastened to enact laws that should, at least, go as far as the federal provision, and many, like our own State, even went beyond the provisions of the federal law. The point to this is, that the State law is not a revenue measure. It is a police law and is not subject to the same rules in the enforcement of its provisions as is a revenue law. This led to the Supreme Court decision, which was handed down June 5, 1916, and noted in the issue of the JOURNAL for June 15. Mr. Justice Holmes delivered the opinion of the Court, Mr. Justice Hughes and Mr. Justice Pitney dissenting. This is often spoken of as the Chinese possession case.

This was a case where a habitual user had obtained one drachm of morphine, by means of a prescription. The government in this case contended "That Congress gave it (the law) the appearance of a taxing measure, in order to give it a coating of constitutionality, but that it really was a police measure that strained all the powers of the legislature and that Sect. 8 means all it says, taking its words in their plain literal sense." The district judge considered that the act was a revenue act and that the general words "any person" must be confined to the class of persons with whom the act previously had been purporting to deal. To quote further:

"It may be assumed that the statute has a moral end, as well as a revenue, in view—but we are of opinion that the District Court in treating those ends as to be reached only through a revenue measure and within limits of a revenue measure was right."

This decision places the manufacture and sale of drugs in the same position as is occupied by the manufacture and sale of spiritous liquors. The penalty would apply to a person who manufactured and sold without paying his tax, but it would not make a criminal of the customer. The result of this decision will be to confine the

prosecutions to those registered under the Act, and in many cases, at least, that would be where it would naturally fall, for it is quite obvious that the cost and difficulty of an investigation of a considerable portion of our population would be enough in itself to confine it to those who were registered.

At this point, however, comes in our own State legislation which is a police measure and can be administered without difficulty; and the provision of our State law is, that to have narcotics in one's possession without a legal prescription therefor "shall be presumptive evidence that such possession is a violation of this Act." Section 2 provides that a physician shall not give away, prescribe, or deliver any of the prohibited drugs to any person known to such physician to be a habitual user of those drugs, except where the drug is obviously needed for therapeutic purposes.

It will be seen by this that we have an adequate State law, but we are confronted with the menace of a mercenary motive, which is established in Section 1, for there the penalty of violation of this Act is avoided, if the possessor has a legal prescription therefor. To be sure, this is covered in Section 2 by a provision which says that a physician may not prescribe these drugs to a habitual user, except when the drug is obviously needed for therapeutic purposes. Under this law it seems impossible that any man viewing this matter from a strictly business standpoint could, for a moment, undertake to evade the law; for the publicity necessary—in the form of reports—must quickly be in full view of the prosecuting officer; and even if there should be an opening to escape the penalty, through some technicality in a court of law, there is a penalty which is nearly as far-reaching as that provided in the law, and which cannot be escaped by a mere technicality. A man governed solely by a question of policy will not lightly jeopardize his right to practise medicine in the State; and that is precisely what he does, if he fails to fulfil honestly and sincerely both the letter and the spirit of the law. Taking into consideration the prohibition in Section 1 of our State law in regard to possession, and the restrictions in Section 2 imposed upon the prescriber, it would seem as though a great help would be rendered to the prosecuting officer if physicians were required to report to the proper State department all chronic cases requiring

narcotics, as well as all cases under treatment for cure of the habit.

The final success of these laws is absolutely beyond question. They have already accomplished a vast amount of good, and their efficiency will increase rapidly during the next few years. They are an epoch-making period in humanitarian legislation, and can only be prevented from a quick realization of their aims by immoral conduct on the part of those legally authorized to prescribe and dispense.

It may be well to call the attention of physicians to the fact that a record-book, distinct and separate from daily cards or case cards, is absolutely necessary in order to comply with the law. A moment's thought will suffice to give the reason. It is a matter of satisfaction to know that in this first year, when rulings and counter-rulings, regulations and counter-regulations have been the order, the medical men, as a rule, have patiently borne the inconveniences imposed upon them by these laws, and in every sense have maintained the ideals of the profession.



THE RÔLE OF THE MEDICAL PROFESSION IN PREPAREDNESS.

THE movement for national military preparedness has in a manner overlooked the important part that the medical profession must necessarily play in any active display of this preparedness. That military medicine is an art quite apart in its organization from civil medicine, and that even a high degree of ability in the practice of medicine does not of itself fit one to practise military medicine, is now well accepted. In countries having compulsory universal military service the medical military arms are provided for on a scale proportionate to the numbers in service. Yet even there in war times it is found that the organized military medical establishments are far from sufficient. Every one of the countries now at war has been glad to avail itself of the help of outside medical units. The training of these units for efficiency for military purposes has not been very difficult, principally because there were in the countries having compulsory service a sufficient number of military medical officers to train the new units into line.

On the other hand, in countries having voluntary military service, on such small scales as here, with the organized medical arms likewise small, it would be a most difficult problem to train civilian medical men for military duty when needed on a large scale and for immediate service. The establishment of the medical reserve corps is a step in the right direction. Its usefulness is somewhat curbed because of the lack of facilities for real training. *The Military Surgeon* of June, 1916, calls attention to the urgent need of organizing the medical profession for this work, either through regular camp work, somewhat after the "Plattsburg Idea," by frequent clinics throughout the country devoted to this subject or by periodic medical society meetings of the same nature. To these suggestions might be subjoined the one of adding to the curricula of the medical schools the subject of military medicine and surgery.

The medical material in this country is numerically very great. The many rural communities have developed physicians who are supremely adapted for emergency medical and surgical work of all kinds such as would be encountered in the field, while the highly specialized medical men of the larger centers would be well adapted for the finer base hospital work. A little extra training and study is all that is necessary to make this material convertible. Besides, even though military medicine is somewhat of a new art, it is an art that must keep abreast with the progress in medicine, and be keen to adopt and adapt it to its particular field. An interest in the military problems of medicine cannot fail to stimulate an interest in the general advances in medicine, which must redound to the efficiency of the profession and to the advancement of the science, as well as to the benefit of the country.

Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

First Day, June 6, 1916.

Clinics and demonstrations were held during the morning at the principal hospitals in Boston.

The annual meeting of the Supervising Centers was held in the foyer of the Copley-Plaza Hotel, Boston, at 11.30 o'clock. It was attended

by fifteen Supervisors. A committee was appointed to arrange for uniform examinations throughout the State, and another committee to consider proposed changes in the rules governing applications for fellowship and the times for holding examinations.

The annual meeting of the Council was held in the same room at noon. (See Proceedings of the Council in the *JOURNAL*, June 22, 1916.)

Meetings of the Sections were held in the Copley-Plaza Hotel, in the afternoon. The Sections were officered and papers presented according to the following program:

MEETING OF THE SECTION OF MEDICINE.

Foyer, Copley-Plaza, Hotel.

2.30 o'clock.

Officers of the Section of Medicine:

Dr. Henry Jackson, Boston, *Chairman*.

Dr. F. Gorham Brigham, Boston, *Secretary*.

(Program arranged by officers of section.)

Diabetes.

1. Results Obtained in the Treatment of Diabetic Cases, May 1, 1915-May 1, 1916.—Dr. Elliott P. Joslin, Boston.

2. Definition and Determination of Acidosis in Diabetes Mellitus.—Dr. Albert A. Hornor, Boston.

3. Observations on the Blood Sugar in Diabetes Mellitus.—Dr. Orville F. Rogers, Jr., Boston.

Discussion.—Dr. Harry W. Goodall, Boston; Dr. Walter R. Bloor, Boston; Dr. G. Carroll Smith, Boston.

Nephritis.

1. Tests of Renal Function from the Standpoint of the General Practitioner.—Dr. Francis W. Peabody, Boston.

2. Eye Changes in Renal Diseases, Their Diagnostic and Prognostic Value.—Dr. Peter Hunter Thompson, Boston.

Discussion.—Dr. Channing Frothingham, Jr., Boston; Dr. George S. Derby, Boston; Dr. George Van Ness Dearborn, Boston; Dr. H. D. Arnold, Boston.

Attendance, 226.

MEETING OF THE SECTION OF SURGERY.

State Dining-Room, Copley-Plaza Hotel.

2.30 o'clock.

Officers of the Section of Surgery:

Dr. Charles E. Durant, Haverhill, *Chairman*.

Dr. Walter M. Boothby, Boston, *Secretary*.

(Program arranged by officers of section.)

Symposium on Fractures.

1. Fractures of the Base of the Skull.—Dr. Harvey Cushing, Boston.

2. The Importance of Early Reduction of Fractures with Displacement.—Dr. William Darrach, New York City.

3. The Treatment of Hip Fractures.—Dr. Frederic J. Cotton, Boston.

4. Certain Facts Concerning the Operative Treatment of Fractures of the Patella. (With lantern slides.)—Dr. Charles L. Scudder, Boston, and Dr. R. H. Miller, Boston.

5. Some Aspects of the Treatment of Compound Fractures Under Civil and Military Conditions.—Dr. David Cheever, Boston.

Discussion.—Dr. Robert W. Lovett, Boston; Dr. John Baptist Blake, Boston; Dr. John Homans, Boston; Dr. F. B. Lund, Dr. W. J. Mixer, Dr. J. Collins Warren, Boston.

Attendance, 200.

MEETING OF THE SECTION OF TUBERCULOSIS.

Ballroom, Copley-Plaza Hotel.

2.30 o'clock.

Officers of the Section of Tuberculosis:

Dr. Albert C. Getchell, Worcester, *Chairman*.
 Dr. John B. Hawes, 2d, Boston, *Secretary*.
 (Program arranged by officers of section.)

1. Tuberculosis and Syphilis.—Dr. James A. Lyon, Rutland State Sanatorium.

Discussion.—Dr. W. A. Hinton, Cambridge; Dr. C. Morton Smith, Boston; Dr. R. I. Lee, Cambridge.

2. Tuberculosis Carriers.—Dr. Charles E. Perry, Hampshire County Sanatorium, Haydenville.

Discussion.—Dr. A. K. Stone, Boston; Dr. Adam S. MacKnight, Fall River; Dr. Charles J. Downey, Springfield.

3. What Constitutes Clinical Tuberculosis in Adults.—Dr. George L. Schadt, Springfield.

Discussion.—Dr. Cleaveland Floyd, Boston; Dr. Henry D. Chadwick, Westfield State Sanatorium; Dr. F. P. McCarthy, Dr. Abner Post, Dr. E. O. Otis, Boston.

Attendance, 75.

Officers of the Sections for the ensuing year were elected by the Sections respectively as follows:

Section of Medicine: Chairman, Brace W. Paddock, Pittsfield; Secretary, James H. Means, Boston.

Section of Surgery: Chairman, Frederic J. Cotton, Boston; Secretary, Albert Ehrenfried, Boston.

Section of Tuberculosis: Chairman, Walter G. Phippen, Salem; Secretary, John B. Hawes, 2d, Boston.

The Shattuck Lecture was delivered in the foyer of the Copley-Plaza Hotel, in the evening, by Dr. Theodore C. Janeway, of Baltimore, on "The Etiology of the Diseases of the Circulatory System." Attendance, 457.

Second Day, June 7, 1916.

The Society met at the Copley-Plaza Hotel for the exercises of the one hundred and thirty-fifth anniversary, at 9.30 a.m. The President, Dr. Charles F. Withington, was in the chair, and about 150 Fellows were present during the morning. The minutes were read and accepted. The Secretary announced that during the past year the Society had lost by death 59 Fellows, by resignation 23, by deprivation of the privileges of fellowship 23, making a total loss of 105. The Society had gained 156 Fellows as follows: restoration by the Council, 7, readmitted by the Censors 1, new Fellows 148, a net gain of 51, making the total membership 3633.

The following two proposed amendments to the By-Laws, that had received favorable action at the meetings of the Council, October 6,

1915, and June 6, 1916, and had been published in the call for the meeting, were passed without a dissenting voice:

Section 1 of Chapter II shall be amended by transposing the words "unless otherwise ordered by the Council," in the second and third lines of the said Section, and by omitting all of the text after the word "June" in the fourth line, so that the Section as amended, will read as follows:—

"The annual meetings of the Society, shall be held, unless otherwise ordered by the Council, in Boston, on the second Wednesday in June."

Chapter IV, Section 1.

In the second line after the word, "president" insert the word, "ex-presidents", and in the third line omit the word "and", and after the word "treasurer", insert the words, "and librarian", so that the Section shall read as follows:—

"Section 1. The Council shall consist of councillors chosen by the district societies, and the president, ex-presidents, vice-president, vice-presidents, *ex officio*, secretary, treasurer and librarian of the general society, and the chairman of each standing committee."

The following proposed amendment to Chapter VII, Section 3, that had received the favorable action of the Council, October 6, 1915, was read by the secretary.

Chapter VII, Section 3, that the word "June" in the last line of the fourth paragraph be changed to "March"; so that the clause shall read: "This dividend shall be apportioned among the district societies according to the number of annual assessments which shall have been paid to the district treasurers previous to March first."

Dr. J. G. Hanson, Treasurer of the Hampshire District Society, asked for the reasons for making the contemplated change in the by-law. These were given by the Treasurer of the Society, Dr. Buckingham, who said that the principal reason was that the methods of collecting assessments were adapted to the requirements of a small society, rather than to one of 3600 Fellows; that it is more business like to have early payment required; that a majority of the disputed bills are those that are paid at the annual meeting; that he did not favor having bills paid at the annual meeting. Dr. Hanson agreed with the Treasurer and thought that some amendment should be incorporated whereby a Fellow could not attend the annual dinner unless his dues were paid in advance of the date of the meeting. Dr. Green, Chairman of the Committee on Membership and Finance, explained that the amendment did not prevent a Fellow from coming to the meeting, paying his dues and receiving his dinner ticket, but it provided that those district treasurers who are active and get in more dues early, receive a larger rebate for their societies. The matter had received considerable attention by his Committee, and it had been introduced by him at the request of his Committee. Two months are a sufficient time, in the opinion of the Commit-

tee, in which to pay dues that are payable in advance, and thus receive the premium of the rebate for so doing.

On being put to a vote, the amendment was passed unanimously.

Dr. J. W. Farlow, Librarian of the Boston Medical Library, reported for a joint committee of the Library and the Massachusetts Medical Society, consisting of H. C. Ernst, J. W. Farlow, E. W. Taylor, G. S. Derby and Channing Frothingham, Jr., to consider the advisability of continuing the index catalogue of the Surgeon-General's Library, at Washington, now that the second series is nearing completion, and offered the following resolution, which was passed unanimously:

Resolved: That the Massachusetts Medical Society accepts the report of the joint committee of the Boston Medical Library and the Massachusetts Medical Society, and strongly recommends that the third series of the index catalogue of the Surgeon-General's Library should be begun and continued to completion.

Dr. Edward Reynolds introduced the subject of the anti-cancer campaign, and explained that it is necessary that the public shall not outstrip the medical profession in its knowledge of or interest in such an important matter. He offered this resolution, which received an affirmative vote.

Resolved: That a committee of five be appointed by the President to consider the duty of the Massachusetts Medical Society towards the education of the members of the profession in this State, in connection with the existing Anti-Cancer Campaign; that they be directed to confer with the American Society for the Control of Cancer through its executive secretary and to report their conclusions at the meeting of the Council in October, 1916.

In accordance with the resolution the President appointed this committee, Edward Reynolds, R. B. Greenough, J. Collins Warren, J. T. Bottomley, E. P. Richardson.

The President made these announcements:

The Surgeon-General of Massachusetts invites the Fellows of the Massachusetts Medical Society to inspect the property of Field Hospital Company No. 1 and Ambulance Company No. 1, at the Commonwealth Armory, head of Pleasant Street, Allston, from 2 p.m. to 5 p.m., Wednesday, June 7.

Dr. Samuel Bates Grubbs, United States Public Health Service, invites the members of the Massachusetts Medical Society to visit the United States Quarantine Station, Gallops Island, Wednesday afternoon, June 7. The quarantine steamer, *Vigilant*, will leave foot of Long Wharf at 3 p.m. and will return at 6 p.m. The methods and equipment for handling plague, cholera, typhus fever and other infectious diseases will be shown, as well as four cases of beri-beri now in the hospital.

Papers were read on the following topics, viewed from the standpoint of public health and preventive medicine:

1. The Relation of the State Department of Health to the Communicable Diseases of Childhood.—Dr. A. J. McLaughlin, Boston.
2. Measles.—Dr. E. H. Place, Boston.
3. Scarlet Fever (Illustrated with lantern slides).—Dr. F. B. Mallory, Boston.
4. Scarlet Fever.—Dr. C. V. Chapin, Providence, R. I. (Read by title.)
5. Diphtheria.—Dr. J. S. Hitchcock, Northampton.
6. Diphtheria.—Dr. W. H. Park, New York City.
7. Whooping Cough.—Dr. J. L. Morse, Boston.

The Annual Discourse was delivered at twelve o'clock, by Dr. David L. Edsall, of Boston, on "Movements in Medicine." On motion by Dr. F. W. Taylor the thanks of the Society were voted Dr. Edsall for his able and instructive address.

In the afternoon there was a combined meeting of the Sections of Medicine and Surgery at the Peter Bent Brigham Hospital, under the chairmanship of Dr. C. E. Durant, Haverhill, and Dr. Henry Jackson, Boston, and secretaryship of Dr. F. Gorham Brigham, Boston, and Dr. W. M. Boothby, Boston, when the following program was presented.

COMBINED MEETING.

Symposium on Goitre.

1. Medical Treatment of Goitre.—Dr. David L. Edsall, Boston.
2. Surgical Treatment of Goitre.—Dr. C. A. Porter, Boston.
3. Recent Advances in our Knowledge of the Active Constituent in the Thyroid: Its Chemical Nature and Function.—Dr. Edward C. Kendall, Rochester, Minn.
4. Some Recent Experimental Work on the Thyroid Gland.—Dr. Walter B. Cannon, Boston.
5. Metabolism Studies of Thyroid Cases.—Dr. Walter M. Boothby, Boston.

Discussion.—Dr. Frank H. Lahey, Boston; Dr. Malcolm Seymour, Boston; Dr. T. C. Janeway, Baltimore; Dr. M. C. Smith, Lynn.
Attendance, 350.

The Annual Dinner was served in the ballroom of the Copley-Plaza Hotel, in the evening, to 704 Fellows and guests. The President made an address and gracefully introduced the following speakers: Hon. Channing H. Cox, Speaker of the House of Representatives of Massachusetts; Hon. Frederick Lawton, Justice of the Superior Court of the Commonwealth; Rev. George A. Gordon, Pastor of the Old South Church; Professor William T. Sedgwick, of the Massachusetts Institute of Technology; Dr. J. W. Courtney; and the President-elect, Dr. Samuel B. Woodward, of Worcester.

Adjourned.

WALTER L. BURRAGE, *Secretary*.

DEATHS REPORTED FROM JUNE 9, 1915, TO JUNE 7, 1916.

Admitted.	Name.	Place of Death.	Date of Death.	Age.
1893	Bemis, John Merrick	Worcester	Sept. 22, 1915	55
1874	Blood, Robert Allen	Sunapee, N. H.	Feb. 21, 1916	77
1871	Bolles, William Palmer	Santa Barbara, Cal.	Mar. 18, 1916	70
1858	Campbell, Benjamin Franklin	Brookline	Jan. 9, 1916	81
1867	Chase, Horace	Dorchester	Jan. 11, 1915	83
1858	Cheever, David Williams	Boston	Dec. 27, 1915	84
1854	Choate, David	Salem	Apr. 23, 1916	87
1880	Cleaves, James Edwin	Medford	June 20, 1915	61
1890	Darrah, Rufus Elmer	Newport, R. I.	Feb. 8, 1916	54
1872	Dearborn, John George	Charlestown	Jan. 3, 1916	77
1910	Derby, Charles Arthur	New Bedford	Mar. 30, 1914	38
1865	Douglass, John Abbott	Amesbury	Feb. 4, 1916	87
1867	Eveleth, Edward Smith	East Gloucester	Jan. 25, 1916	74
1892	Fahey, James Charles	Northampton	Aug. 24, 1915	48
1873	Fernald, Charles Augustus	Boston	Mar. 15, 1916	68
1892	Follett, Ammi Ward	Somerville	Aug. 15, 1915	57
1883	Foskett, George Mason	Worcester	Feb. 23, 1916	59
1890	Fourtin, Edward Randolph Peaslee	Waltham	Mar. 15, 1916	50
1888	Gillard, Arthur Ernest	Lowell	Apr. 15, 1915	50
1893	Goldthwaite, Seth Vale	Allston	Apr. 9, 1916	68
1905	Haché, Henry Clement	Boston	Jan. 7, 1916	47
1914	Hanafin, John Francis	Saranac, N. Y.	May 7, 1916	30
1906	Hancock, Albert William	Salisbury	June 18, 1915	38
1897	Hastings, John Mason	Provincetown	June 10, 1915	45
1880	Hobbs, Ezra Allen	Framingham	Mar. 25, 1916	70
1879	Hooker, Charles Parker	Fortune Rocks, Me.	July 21, 1915	59
1891	Houghton, Silas Arnold	Brookline	Feb. 6, 1916	51
1857	Jeffries, Benjamin Joy	Boston	Nov. 21, 1915	82
1884	Kenney, John Erie	Chelsea	May 3, 1916	54
1879	Kimball, William George	Huntington	Oct. 20, 1915	68
1892	Knowlton, Herbert Eugene	San Diego, Cal.	Oct. 24, 1915	49
1893	Leahy, Thomas Joseph	Cambridge	Dec. 25, 1915	46
1897	Lozan, Frank Barker Tays	Gloucester	May 26, 1916	50
1905	Maloney, Thomas Aloysius	New Britain, Conn.	July 13, 1915	40
1869	McCollom, John Hildreth	Boston	June 14, 1915	72
1900	McCormick, Alfred Hugh	Northampton	Oct. 28, 1915	44
1908	Moore, John Francis	Worcester	Apr. 15, 1916	35
1887	Noble, Alfred Ira	Detroit, Mich.	Jan. 20, 1916	58
1891	Noves, William	Jamaica Plain	Oct. 20, 1915	57
1907	O'Connor, Thomas Hugh	Roxbury	Mar. 30, 1916	59
1862	Pinkham, George Edwin	Lowell	Nov. 15, 1915	75
1873	Redfean, Joseph	Marlborough	July 1, 1915	65
1888	Richardson, Benjamin Franklin	Lynn	Feb. 15, 1916	82
1912	Roddy, Martin Bernard	Lynn	Aug. 12, 1915	29
1873	Rowe, George Howard Malcolm	Boston	Jan. 30, 1916	72
1871	Russell, Frederick William	Dallas, Tex.	Nov. 20, 1915	71
1883	Stevens, William Stanford	Boston	Apr. 29, 1916	56
1885	Stone, Charles Sinclair	Boston	Apr. 22, 1916	56
1913	Swanson, Axel Fridolf	Easthampton	Mar. 19, 1916	25
1908	Teahan, William John	Holyoke	Jan. 11, 1916	36
1902	Tohey, Edward Nelson	At sea	Aug. 16, 1915	44
1854	Trow, William Marshall	Buckland	Sept. 13, 1913	86
1860	Warren, Orin	West Newbury	Apr. 6, 1916	83
1859	Webster, Joseph Rowe	North Lexington	May 9, 1916	82
1846	Wellington, James Lloyd	Swansea	Feb. 11, 1916	98
1904	Wernick, Benzion G.	Roxbury	Feb. 23, 1916	48
1856	White, James Clarke	Boston	Jan. 6, 1916	82
1874	Wicht, Daniel Webster	Casco, Me.	Nov. 20, 1915	78
1885	Wolcott, Grace	Heath	Nov. 9, 1915	87
Total, 59.				

ADMISSIONS REPORTED FROM JUNE 9, 1915, TO

Year of Admission.	Name.	Residence.	Medical College.
1916	Adamian, Hovsep Garo, Lawrence	.....	10
1915	Albee, Kenneth Field, Weston	.....	11
1915	Alcuzar, Isaac, Roxbury	.....	11
1916	Alley, Leon Arthur, Brockton	.....	12
1915	Andrews, Oren, Gardner	.....	7
1916	Armitage, Henry George, Haverhill	.....	12
1916	Bannerman, Walter Bruce, East Bridgewater	.....	9
1915	Barry, Rolla Grant, Worcester	.....	20
1915	Bates, Charles Atwood, Ashburnham	.....	22
1916	Berlin, Maurice George, Dorchester	.....	12
1915	Bone, Herman David, Gardner	.....	22
1915	Brassil, Timothy Francis, Cambridge	.....	12
1915	Brewster, David Truman, Jr., Danvers	.....	15
1915	Brown, Roy Farrington, Fall River	.....	12
1916	Buck, Charles Edward, Boston	.....	12
1915	Bunker, Sidney Moore, Worcester	.....	22
1915	Burt, Clarence Edward, New Bedford	.....	10
1916	Butler, David Mathew, Brockton	.....	12
1916	Butler, Francis Joseph, Worcester	.....	4
1915	Callahan, John Francis, Brockton	.....	12
1916	Carey, Francis Arthur, Taunton	.....	8
1910	Caro, Heiman, Monson	.....	11
1915	Chapin, William Andrew Robertson, Springfield	.....	2
1915	Collins, Frank Laforest, Salem	.....	55
1915	Constans, Frank Elmore, Brockton	.....	21

Year of Admission	Name	Residence	Medical College	Year of Admission	Name	Residence	Medical College
1915	Copeland, Elmer Humphrey,	Northampton	31	1915	Miner, Leroy Matthew Simpson,	Newtonville	10
1915	Cosby, Edwin Gordon,	South Boston	12	1916	Morriss, William Sarsfield,	Fall River	11
1915	Crandall, Walter Midkiff,	Lawrence	12	1915	Mott, George Ernest,	Worcester	12
1915	Cudworth, Clarence Duane,	Millers Falls	40	1916	Moulton, Allen Thomas,	Roxbury	32
1916	Cullen, Charles Andrew,	Hyde Park	12	1915	Nigro, Michele,	Chelsea	11
1915	Curtin, John Francis,	North Abington	32	1916	Orcutt, Wallace Lyman,	West Newbury	2
1916	Cutler, Elliott Carr,	Boston	11	1916	O'Reilly, Francis Augustine,	Lawrence	12
1916	Daniels, Ora George,	Canton	11	1916	Papas, Prodomos Nicholas,	Boston	11
1915	Davis, George Rufus,	Marshfield Hills	22	1915	Partington, Cyrus Brown,	Jamaica Plain	12
1915	Denny, George Parkman,	Boston	11	1916	Persky, Myer Arthur,	Pittsfield	12
1915	Dezell, Frederick Burr,	Lynn	15	1916	Pillsbury, Arthur Russell,	Wrentham	22
1916	Doherty, Francis Joseph,	Brighton	11	1916	Powers, William Joseph,	Holyoke	32
1915	Dolan, William Edward,	Worcester	8	1915	Pratt, Emily Adelaide,	Gardner	12
1915	Dolan, William Francis,	Somerville	11	1915	Price, Oscar Jay,	Somerville	12
1915	Donovan, Sylvester Edward,	New Bedford	29	1916	Prouty, Ira Humphrey,	Marblehead	6
1916	Doray, Frank Leslie,	Worcester	11	1915	Rapaport, Boris,	Salem	12
1915	Drury, John Nelson,	Lowell	29	1916	Reed, Beatrice Alma,	Taunton	12
1916	Dutton, Frank Kingsley,	Chicopee Falls	12	1915	Robb, Hunter,	Cambridge	19
1915	Eaton, Harold Burney,	Boston	11	1916	Roney, Hugh Beverly,	Pittsfield	21
1916	Elkind, Henry Byron,	Worcester	12	1915	Schofield, Roger William,	Worcester	11
1916	Emerson, Paul Waldo,	Boston	11	1916	Schwartz, George Harvey,	Lynn	12
1915	Farrar, Lonnie Oliver,	Bridgewater	22	1915	Scott, Norman McLean,	Boston	12
1915	Fisher, Gertrude Guild,	Boston	16	1916	Shapira, Albert Abraham,	Boston	11
1916	Fiske, Eben Winslow,	West Newton	14	1915	Shanks, Charles,	New Bedford	11
1916	Fobes, Howard Edward,	Whitman	12	1916	Shine, Honoria Connelly,	Holyoke	33
1915	Forhan, Neil Kittredge,	North Billerica	12	1916	Silbermann, Maurice,	Revere	35
1915	Fraser, Joseph Anthony,	New Bedford	17	1916	Skirball, Louis Irving,	Revere	22
1915	Fuller, Solomon Carter,	Westborough	10	1916	Smith, Chiron Waterville,	Marlborough	20
1916	Garland, Frederick Eugene,	Gardner	11	1915	Spinney, Frederic Ira,	Somerville	12
1915	Gervais, Harriet Marion,	Boston	12	1915	Stansfield, Oliver Holt,	Worcester	12
1915	Gilchrist, John Milton,	Springfield	11	1916	Steele, George Louis,	West Springfield	12
1915	Glidden, Edson William,	Lakeville	32	1915	Stevens, William Russell,	Abington	12
1916	Golob, Meyer,	Chelsea	24	1915	Strong, Seth Lake,	Marshfield Hills	11
1916	Golub, Jacob Joshua,	Boston	10	1916	Sullivan, Eulick Francis,	Holyoke	22
1916	Gould, Carlisle Royal,	Salem	5	1915	Sullivan, John Albert,	Pittsfield	15
1915	Gray, Horace,	Boston	11	1915	Talbot, John Edward,	Holliston	11
1916	Gray, Hugh Barr,	Boston	11	1916	Tate, Harry John,	Pittsfield	4
	(Readmitted by Censors.)			1915	Trueman, Nelson Gore,	Danvers	11
1916	Greaney, William Francis,	Holyoke	4	1916	Van De Velde, Honoré,	Boston	38
1916	Green, Harold Russell,	Fitchburg	12	1915	Walker, Melvin Harvey,	Jr., Pittsfield	11
1915	Hall, Charles Francis Adams,	Newburyport	10	1915	Watts, Harry Adelbert,	Malden	21
1916	Hall, Custis Lee,	Boston	3	1915	Wheatley, Frank Edward,	North Abington	11
1916	Hand, Edward Patrick,	Holyoke	4	1915	Wheat, Harry Ray,	Boston	12
1915	Harris, Lorne Wilborne,	Saugus	20	1916	Whitcomb, Clarence Adelbert,	Springfield	12
1916	Hassman, David Morris,	Roxbury	12	1915	Williams, David Lawrence,	Boston	12
1915	Hearn, Walter Lawrence,	Lynn	11	1915	Williams, Frankwood Earl,	Cambridge	13
1915	Hersam, Norman Paul,	Stoneham	11	1916	Williams, Frederick Horace,	Brookline	9
1916	Hilliard, William David,	Northampton	20	1916	Wright, Willard Lyman,	Springfield	12
1916	Hodgkins, Edward Marshall,	Boston	12	1915	Young, Annie Roberts,	Waltham	12
1916	Howard, Herbert Handy,	Somerville	11	Total, 148+1=149. Restored by Council, 7.			
1916	Hunt, Albert Foster,	Bridgewater	11	Total gain, 156.			
1915	Hunt, William Elliot,	Bridgewater	12	KEY TO MEDICAL COLLEGES.			
1915	Jewett, Everett Porter,	Worcester	12	2	Yale University, Medical Department.		
1915	Johnson, Charles Frederic,	Newburyport	10	3	George Washington University, Department of Medicine.		
1915	Jurist, Charles,	Springfield	29	4	Georgetown University School of Medicine.		
1915	Kemp, Lysander Schaffer,	Canton	12	5	Medical School of Maine.		
1915	Kirkwood, Allan Stewart,	Newton Center	29	6	Johns Hopkins University, Medical Department.		
1916	Konrad, Frank Charles,	Boston	11	7	College of Physicians and Surgeons, Baltimore, Md.		
1916	Lane, Elwin Dexter,	Andover	10	8	Baltimore Medical College.		
1915	La Rivière, Athanasé de Charette Evariste,	New Bedford	4	9	University of the South.		
1916	Leavitt, Frank Clyde,	Belmont	19	10	Boston University School of Medicine.		
1916	Leonard, Edward De Witt,	Newton Center	11	11	Harvard University Medical School.		
1915	Leonard, Zenas Lockwood,	West Stockbridge	29	12	Tufts College Medical School.		
1915	Levine, Samuel Albert,	Boston	11	13	University of Michigan, Department of Medicine and Surgery.		
1915	Look, Percy Jonathan,	Andover	11	14	Dartmouth Medical School.		
1915	Lowrey, Lawson Gentry,	Danvers	11	15	Albany Medical College.		
1915	Mansfield, Burleigh Burton,	Salem	5	16	Cornell University Medical College.		
1915	Marsh, Albert,	Reading	15	17	Columbia University College of Physicians and Surgeons.		
1916	Martin, David Lorenzo,	Dorchester	10	19	University of Pennsylvania, Department of Medicine.		
1916	Marvin, Frank William,	Boston	11	20	Jefferson Medical College.		
1915	Mathewson, Frank Weeden,	New Bedford	10	21	Hahnemann Medical College and Hospital of Philadelphia.		
1916	Mayers, John Edward,	South Boston	22				
1915	Miller, John Alfred Parsons,	Boston	11				
1916	McPeake, John Richard,	Mattapan	43				
1916	Merrill, Charles Henry,	Lynn	11				
1915	Mills, Charles Fisher,	Framingham	11				

- 22 University of Vermont, Medical Department.
 24 Medico-Chirurgical College of Philadelphia.
 29 University and Bellevue Hospital Medical College.
 31 New York Homeopathic Medical College and Flower Hospital.
 32 University of Maryland, School of Medicine.
 33 Woman's Medical College of Pennsylvania.
 35 Medical College of Virginia.
 38 University of Louvain, Belgium.
 40 Hahnemann Medical College and Hospital of Chicago.
 43 College of Physicians and Surgeons, Boston.

OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Chosen by the Council, June 6, 1916.

Samuel B. Woodward, Worcester, President.
 Frederic W. Taylor, Cambridge, Vice-President.
 Walter L. Burrage, Boston, Secretary.
 Edward M. Buckingham, Boston, Treasurer.
 Edwin H. Brigham, Brookline, Librarian.

STANDING COMMITTEES.

For 1916-1917.

Of Arrangements.—E. L. Young, Jr., J. H. Young, J. L. Huntington, R. H. Miller, C. H. Lawrence, Jr., Donald Macomber.

On Publications and Scientific Papers.—G. B. Shattuck, E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green.

On Membership and Finance.—C. M. Green, Algonon Coolidge, Jr., Samuel Crowell, F. W. Taylor, Alfred Worcester.

On Ethics and Discipline.—J. A. Gage, J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever.

On Medical Education and Medical Diplomas.—H. C. Ernst, C. F. Painter, H. W. Newhall, J. F. Burnham, Channing Frothingham, Jr.

On State and National Legislation.—S. B. Woodward, F. G. Wheatley, W. P. Bowers, W. H. Robey, Jr., J. S. Stone.

On Public Health.—M. J. Rosenau, W. I. Clark, Annie L. Hamilton, E. H. Bigelow, R. I. Lee.

PRESIDENTS OF DISTRICT MEDICAL SOCIETIES.

VICE-PRESIDENTS (EX OFFICIO).

(Arranged according to seniority of fellowship in the Massachusetts Medical Society.)

F. C. Granger, Randolph.....	Norfolk South
J. W. Heath, Wakefield.....	Middlesex East
W. D. Swan, Cambridge.....	Middlesex South
G. O. Ward, Worcester.....	Worcester
F. B. Pierce, Haverhill.....	Essex North
Emile Poirier, Salem.....	Essex South
Paul Thorndike, Boston.....	Suffolk
J. V. Meigs, Lowell.....	Middlesex North
N. K. Noyes, Duxbury.....	Plymouth
G. L. Taylor, Holyoke.....	Hampden
A. Wheeler, Leominster.....	Worcester North
A. C. Lewis, Fall River.....	Bristol South
T. F. Greene, Roxbury.....	Norfolk
A. K. Boom, Adams.....	Berkshire
J. P. Nickerson, West Harwich.....	Barnstable
W. H. Allen, Mansfield.....	Bristol North
H. N. Howe, Greenfield.....	Franklin
C. A. Byrne, Hatfield.....	Hampshire

COUNCILORS, 1916-1917.

NOTE.—The initials M.N.C. following the name of a councilor indicate that he is a member of the Nominating Committee. V.P. indicates that a member is a councilor by virtue of his office of president of a district society, and so vice-president of the general society. C. indicates that he is chairman of a standing Committee. E.P. indicates ex-president.

BARNSTABLE.

J. P. Nickerson, V.P., West Harwich.
 E. E. Hawes, M.N.C., Hyannis.
 C. W. Milliken, Barnstable.

BERKSHIRE.

A. K. Boom, V.P., Adams.
 Henry Colt, Pittsfield.
 E. A. Kennedy, Great Barrington.
 E. W. Markham, Lee.
 J. H. Riley, M.N.C., North Adams.

BRISTOL NORTH.

W. H. Allen, V.P., Mansfield.
 Sumner Coolidge, Middleborough.
 R. D. Dean, Taunton.
 F. A. Hubbard, M.N.C., Taunton.
 S. D. Presbrey, E.P., Taunton.

BRISTOL SOUTH.

A. C. Lewis, V.P., Fall River.
 E. F. Cody, New Bedford.
 C. F. Connor, New Bedford.
 E. F. Curry, Fall River.
 W. A. Dolan, Fall River.
 R. W. Jackson, Fall River.
 A. H. Mandell, M.N.C., New Bedford.

ESSEX NORTH.

F. B. Pierce, V.P., Haverhill.
 G. M. Atwood, Bradford.
 R. V. Baketel, Methuen.
 I. J. Clarke, Haverhill.
 G. E. Kurth, Lawrence.
 E. H. Noyes, Newburyport.
 J. J. O'Sullivan, Lawrence.
 H. P. Robinson, Amesbury.
 F. W. Snow, M.N.C., Newburyport.

ESSEX SOUTH.

Emile Poirier, V.P., Salem.
 C. H. Bangs, Lynn.
 R. E. Bicknell, Swampscott.
 N. P. Breed, Lynn.
 J. F. Donaldson, Salem.
 D. J. Finegan, Gloucester.
 H. K. Foster, Peabody.
 P. P. Johnson, Beverly.
 G. M. Kline, M.N.C., Danvers.
 Butler Metzger, Lynn.
 P. P. Moore, Gloucester.
 W. G. Phippen, Salem.
 H. E. Sears, Beverly.

FRANKLIN.

H. N. Howe, V.P., Greenfield.
 G. P. Twitchell, M.N.C., Greenfield.
 N. P. Wood, Northfield.

HAMPDEN.

G. L. Taylor, V.P., Holyoke.
 E. P. Bagg, Jr., Holyoke.
 J. M. Birnie, M.N.C., Springfield.
 T. S. Bacon, Springfield.
 R. S. Benner, Springfield.
 E. L. Davis, Springfield.
 G. D. Henderson, Holyoke.
 M. B. Hodskins, Palmer.
 E. A. Knowlton, Holyoke.
 A. G. Rice, Springfield.

HAMPSHIRE.

C. A. Byrne, V.P., Hatfield.
 O. W. Cobb, M.N.C., Easthampton.
 J. S. Hitchcock, Northampton.
 M. W. Pearson, Ware.
 H. G. Rockwell, Amherst.

MIDDLESEX EAST.

J. W. Heath, V-P., Wakefield.
C. J. Allen, Winchester.
E. C. Fish, M.N.C., Melrose.
W. H. Keleher, Woburn.
G. N. P. Mead, Winchester.

MIDDLESEX NORTH.

J. V. Meigs, V-P., Lowell.
A. E. Bertrand, Lowell.
J. J. Cassidy, Lowell.
J. A. Gage, C., Lowell.
J. H. Lambert, Lowell.
J. J. McCarty, M. N. C., Lowell.
E. J. Welch, Lowell.

MIDDLESEX SOUTH.

W. D. Swan, V-P., Cambridge.
M. H. Bailey, Cambridge.
H. T. Baldwin, Chestnut Hill.
S. O. Baldwin, Framingham.
C. H. Cook, Natick.
H. F. Curtis, Somerville.
E. A. Darling, Cambridge.
D. C. Dow, Cambridge.
A. W. Dudley, Cambridge.
G. W. Gay, E-P., Chestnut Hill.
C. M. Hutchinson, Cambridge.
A. A. Jackson, Everett.
S. F. McKeen, Allston.
G. A. Miles, Somerville.
C. E. Mongan, Somerville.
J. F. O'Brien, Charlestown.
C. E. Prior, Malden.
W. A. Putnam, Cambridge.
Godfrey Ryder, Malden.
Joseph Stanton, Brighton.
E. H. Stevens, M.N.C., Cambridge.
J. O. Tilton, Lexington.
Julia Tolman, Arlington.
G. T. Tuttle, Waverley.
F. P. Walcott, E-P., Cambridge.
C. T. Warner, Marlborough.
G. W. W. Whiting, Somerville.
Alfred Worcester, Waltham.

NORFOLK.

T. F. Greene, V-P., Roxbury.
J. W. Ball, Brookline.
W. W. Barker, Dorchester.
E. H. Bricham, L., Brookline.
A. N. Broughton, Jamaica Plain.
P. W. Carr, Hyde Park.
T. J. Coyne, Roxbury.
A. A. Cushing, Brookline.
W. W. Duckering, Dorchester.
H. C. Ernst, C., Jamaica Plain.
M. H. A. Evans, Jr., Dorchester.
C. E. Faunce, Jamaica Plain.
R. W. Hastings, Brookline.
G. W. Kaan, Brookline.
Fradford Kent, Dorchester.
Joseph Kittredge, Brookline.
W. A. Lane, Milton.
Ferry Linenthal, Roxbury.
F. P. McKenna, Jamaica Plain.
T. J. Murphy, M.N.C., Roxbury.
A. P. Perry, Jamaica Plain.
J. W. Pratt, Dedham.
J. A. Reilly, Dorchester.
W. J. Rosenau, C., Brookline.
Victor Safford, Jamaica Plain.
T. M. Shea, Roxbury.
F. W. Sleeper, Dorchester.
R. T. Stearns, Mattapan.
J. L. Sullivan, Roxbury.
A. J. White, Mattapan.

NORFOLK SOUTH.

F. C. Granger, V-P., Randolph.
C. S. Adams, Wollaston.
J. C. Fraser, M.N.C., East Weymouth.
E. N. Mayberry, South Weymouth.

PLYMOUTH.

N. K. Noyes, V-P., Duxbury.
A. A. MacKeen, Whitman.
Gilman Osgood, Rockland.
A. E. Paine, M.N.C., Brockton.
F. J. Ripley, Brockton.
F. G. Wheatley, North Abington.

SUFFOLK.

Paul Thorndike, V-P., Boston.
E. S. Boland, South Boston.
H. I. Bowditch, Boston.
G. W. W. Brewster, M.N.C., Boston.
E. M. Buckingham, T., Boston.
W. L. Burrage, S., Boston.
David Cheever, Boston.
H. A. Christian, Boston.
A. L. Chute, Boston.
E. A. Codman, Boston.
J. A. Cogan, Boston.
G. A. Craigin, Boston.
E. G. Cutler, Boston.
R. L. DeNormandie, Boston.
Albert Ehrenfried, Boston.
Channing Frothingham, Jr., Boston.
C. M. Green, C., Boston.
J. B. Hawes, 2d, Boston.
W. C. Howe, Boston.
H. T. Hutchins, Boston.
Henry Jackson, Boston.
R. W. Lovett, Boston.
W. A. Morrison, East Boston.
J. L. Morse, Boston.
Abner Post, Boston.
Anna G. Richardson, Boston.
W. H. Robey, Jr., Boston.
D. D. Scannell, Boston.
G. G. Sears, Boston.
G. B. Shattuck, C., Boston.
G. C. Smith, Boston.
Mary A. Smith, Boston.
Peter M. Smith, Boston.
Richard M. Smith, Boston.
F. B. Talbot, Boston.
H. F. Vickery, Boston.
D. H. Walker, Boston.
John Warren, Boston.
C. F. Withington, E-P., Boston.
E. L. Young, Jr., C., Boston.

WORCESTER.

G. O. Ward, V-P., Worcester.
F. H. Baker, Worcester.
W. P. Bowers, E-P., Clinton.
F. H. Clapp, North Grafton.
W. J. Delahanty, Worcester.
J. T. Duggan, Worcester.
M. F. Fallon, Worcester.
Homer Gage, Worcester.
J. O. Genereux, Webster.
David Farrower, M.N.C., Worcester.
A. G. Hurd, Millbury.
W. L. Johnson, Uxbridge.
F. H. Washburn, Holden.
S. B. Woodward, P., Worcester.
C. D. Wheeler, Worcester.

WORCESTER NORTH.

A. A. Wheeler, V-P., Leominster.
E. L. Fiske, Fitchburg.
A. P. Mason, M.N.C., Fitchburg.
E. A. Sawyer, Gardner.
G. B. Underwood, West Gardner.

CENSORS, 1916-1917.

BARNSTABLE.

E. E. Hawes, Supervisor, Hyannis.
S. H. Sears, Yarmouthport.
C. E. Harris, Hyannis.
S. F. Haskins, Cotuit.
W. D. Kinney, Osterville.

BERKSHIRE.

Henry Colt, Supervisor, Pittsfield.
William Galvin, Blackinton.
H. E. Stockwell, Stockbridge.
G. P. Hunt, Pittsfield.
A. C. England, Pittsfield.

BRISTOL NORTH.

F. A. Hubbard, Supervisor, Taunton.
H. B. Baker, Taunton.
H. G. Ripley, Taunton.
T. F. Clark, Taunton.
T. J. Robinson, Taunton.

BRISTOL SOUTH.

W. A. Dolan, Supervisor, Fall River.
J. G. Hathaway, New Bedford.
C. J. Leary, New Bedford.
W. T. Learned, Fall River.
I. N. Tilden, Mattapoisett.

ESSEX NORTH.

J. J. O'Sullivan, Supervisor, Lawrence.
Abbie N. Little, Newburyport.
H. L. Conner, Haverhill.
F. D. McAllister, Methuen.
J. Q. Adams, Amesbury.

ESSEX SOUTH.

N. P. Breed, Supervisor, Lynn.
G. K. Blair, Salem.
O. C. Blair, Lynn.
R. E. Bicknell, Swampscott.
W. V. McDerrott, Salem.

FRANKLIN.

G. P. Twitchell, Supervisor, Greenfield.
C. L. Upton, Shelburne Falls.
C. C. Messer, Montague.
E. G. Best, Greenfield.
J. W. Cram, Colrain.

HAMPDEN.

T. S. Bacon, Supervisor, Springfield.
G. L. Woods, Springfield.
W. C. Leary, Springfield.
D. F. Donoghue, Holyoke.
M. W. Harrington, Indian Orchard.

HAMPSHIRE.

M. W. Pearson, Supervisor, Ware.
E. W. Brown, Northampton.
E. D. Williams, Easthampton.
W. J. Collins, Northampton.
J. E. Hayes, Northampton.

MIDDLESEX EAST.

G. N. P. Mead, Supervisor, Winchester.
H. B. Jackson, Melrose.
Ralph Putnam, Winchester.
J. P. Carroll, Woburn.
James Blenkhorn, Stoneham.

MIDDLESEX NORTH.

E. J. Welch, Supervisor, Lowell.
J. P. McAdams, Lowell.
E. J. Clark, Lowell.
G. H. A. Leahy, Lowell.
G. E. Caisse, Lowell.

MIDDLESEX SOUTH.

J. F. O'Brien, Supervisor, Charlestown.
E. S. Abbott, Waverley.
C. E. Hills, South Natick.
F. W. Rice, Brighton.
F. L. Morse, Somerville.

NORFOLK.

R. W. Hastings, Supervisor, Brookline.
W. C. Kite, Milton.
M. J. Cronin, Roxbury.
B. N. Bridgman, Jamaica Plain.
W. J. Walton, Dorchester.

NORFOLK SOUTH.

J. C. Fraser, Supervisor, East Weymouth.
W. A. Drake, North Weymouth.
W. J. McCausland, Quincy.
T. J. Dion, Quincy.
J. A. Peterson, Hingham.

PLYMOUTH.

F. J. Ripley, Supervisor, Brockton.
W. W. Fullerton, Brockton.
J. H. Drohan, Brockton.
Joseph Frame, Rockland.
R. B. Rand, North Abington.

SUFFOLK.

W. H. Robey, Jr., Supervisor, Boston.
C. N. Cutler, Chelsea.
W. C. Howe, Boston.
J. W. Cummin, Boston.
H. W. Goodall, Boston.

WORCESTER.

F. H. Washburn, Supervisor, Holden.
G. E. Emery, Worcester.
W. E. Denning, Worcester.
C. B. Stevens, Worcester.
D. F. O'Connor, Worcester.

WORCESTER NORTH.

A. P. Mason, Supervisor, Fitchburg.
A. P. Lowell, Fitchburg.
W. F. Robie, Baldwinville.
B. H. Hopkins, Ayer.
H. R. Nye, Leominster.

COMMISSIONERS OF TRIALS.

1916-1917.

Barnstable, W. D. Kinney, Osterville.
Berkshire, H. B. Holmes, Adams.
Bristol North, C. S. Holden, Attleborough.
Bristol South, W. E. Synan, Fall River.
Essex North, J. F. Croston, Haverhill.
Essex South, J. E. Simpson, Salem.
Franklin, F. E. Johnson, Erving.
Hampden, F. H. Allen, Holyoke.
Hampshire, J. M. Fay, Northampton.
Middlesex East, E. S. Jack, Melrose.
Middlesex North, F. E. Varney, North Chelmsford.
Middlesex South, L. M. Palmer, Framingham.
Norfolk, A. P. Perry, Jamaica Plain.
Norfolk South, N. S. Hunting, Quincy.
Plymouth, F. J. Hanley, Whitman.
Suffolk, F. B. Lund, Boston.
Worcester, R. W. Greene, Worcester.
Worcester North, F. H. Thompson, Fitchburg.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES.

1916-1917.

Barnstable.—J. P. Nickerson, West Harwich, President; E. S. Osborne, West Dennis, Vice-President; P. F. Miller, Harwich, Secretary; H. B. Hart, Yarmouthport, Treasurer; C. W. Milliken, Barnstable, Librarian.
Berkshire.—A. K. Boom, Adams, President; A. P. Merrill, Pittsfield, Vice-President; O. L. Bartlett, Pittsfield, Secretary; J. D. Howe, Pittsfield, Treasurer.
Bristol North.—W. H. Allen, Mansfield, President; J. B. Gerould, North Attleborough, Vice-President; A. R. Crandell, Taunton, Secretary; W. Y. Fox, Taunton, Treasurer.
Bristol South.—A. C. Lewis, Fall River, President; J. C. Pifta, New Bedford, Vice-President; A. J. Abbe, Fall River, Secretary and Treasurer.
Essex North.—F. B. Pierce, Haverhill, President; T. R. Healy, Newburyport, Vice-President; J. F. Burnham, Lawrence, Secretary and Treasurer.
Essex South.—Emile Poirier, Salem, President; J. J. Egan, Gloucester, Vice-President; H. P. Bennett, Lynn, Secretary; G. Z. Goodell, Salem, Treasurer; C. M. Cobb, Lynn, Librarian.
Franklin.—H. N. Howe, Greenfield, President; Charles Moline, Sunderland, Vice-President; A. E. Johnson, Jr., Greenfield, Secretary and Treasurer.

Hamden.—G. L. Taylor, Holyoke, President; J. M. Birnie, Springfield, Vice-President; H. L. Smith, Springfield, Secretary and Treasurer.

Hampshire.—C. A. Byrne, Hatfield, President; A. G. Minshall, Northampton, Vice-President; J. D. Collins, Northampton, Secretary; J. G. Hanson, Northampton, Treasurer; F. E. Dow, Northampton, Librarian.

Middlesex East.—J. W. Heath, Wakefield, President; R. D. Perley, Melrose, Vice-President; A. E. Small, Melrose, Secretary; Richard Dutton, Wakefield, Treasurer; G. W. Nickerson, Stoneham, Librarian.

Middlesex North.—J. V. Meigs, Lowell, President; W. P. Lawler, Lowell, Vice-President; J. A. Mehan, Lowell, Secretary; T. B. Smith, Lowell, Treasurer; P. J. Meehan, Lowell, Librarian.

Middlesex South.—W. D. Swan, Cambridge, President; G. T. Tuttle, Waverley, Vice-President; L. S. Hapgood, Cambridge, Secretary; C. A. Dennett, Arlington, Treasurer.

Norfolk.—T. F. Greene, Roxbury, President; F. W. Sleeper, Dorchester, Vice-President; Bradford Kent, Dorchester, Secretary; G. W. Kaan, Brookline, Treasurer.

Norfolk South.—F. C. Granger, Randolph, President; J. H. Ash, Quincy, Vice-President; F. H. Merriam, South Braintree, Secretary and Treasurer and Librarian.

Plymouth.—N. K. Noyes, Duxbury, President; Gilman Osgood, Rockland, Vice-President; A. C. Smith, Brockton, Secretary and Treasurer and Librarian.

Suffolk.—Paul Thorndike, Boston, President; H. F. Vickery, Boston, Vice-President; David Cheever, Boston, Secretary; A. K. Stone, Boston, Treasurer; E. B. Young, Boston, Librarian.

Worcester.—G. O. Ward, Worcester, President; M. F. Fallon, Worcester, Vice-President; E. L. Hunt, Worcester, Secretary; G. O. Ward, Worcester, Treasurer; George Lincoln, Worcester, Librarian.

Worcester North.—A. A. Wheeler, Leominster, President; E. G. Fosgate, Ashburnham, Vice-President; C. H. Jennings, Fitchburg, Secretary; F. H. Thompson, Jr., Fitchburg, Treasurer; L. F. Baker, Fitchburg, Librarian.

MEDICAL NOTES.

PREVENTION OF BLINDNESS IN OHIO.—At the Fourth Annual Convention, National Organization for Public Health Nursing, held at New Orleans May 2, Miss Helena R. Stewart, state supervising nurse under the Department of Public Health Education, State Board of Health, detailed the *modus operandi* of the new law in Ohio. For the period August 20, 1915, to March 31, 1916, 576 cases of inflammation in the eyes of the new-born were reported from 63 out of the 88 counties in that state. Completed records are in file in 351 cases. Physicians reported 196 of these, midwives 101, others 54. It is significant that of the cases reported by physicians, 141, or 72%, used the prophylactic. Out of the 351 cases reported, ten cases of partial blindness were noted.

NEW YORK STATE MEDICAL SOCIETY.—At the recent annual meeting of the New York State Medical Society, Dr. Martin B. Tinker, formerly professor of surgery at the Cornell Med-

ical College, was elected president for the ensuing year.

NEW YORK STATE DEPARTMENT OF HEALTH.—On May 22 Governor Whitman of New York signed an appropriation bill including an item of \$65,000 for the purchase of land and the erection of a laboratory building in the city of Albany for the State Department of Health. The site chosen closely adjoins the Albany Hospital and the new Albany Medical School. The laboratory work of the Health Department is at present carried on with great difficulty in an old stable, which has several times been condemned as unsanitary.

RICE MEMORIAL HOSPITAL.—It is announced that Mrs. Isaac L. Rice of New York has purchased from Cornell University a site at Irvington-on-Hudson for the erection of a convalescent hospital as a memorial to her husband, who died in November, 1914.

ENDOWMENT OF CANCER RESEARCH AT COLUMBIA.—The executors of the estate of the late Emil C. Bundy of New York recently paid to Columbia University the sum of \$100,000 for the endowment of cancer research.

FIRE IN A CHEMICAL LABORATORY.—Report from Chicago states that on April 21 a small fire with an explosion of gases occurred in one of the buildings of the Abbott Laboratories in that city. This accident was not due to the manufacture of ammunition or explosives, as has been alleged in the public press, whose reports of the extent and character of the accident were much exaggerated. The damage was small and the work of the laboratory was resumed the next morning, as usual.

ENDOWMENT FOR JEFFERSON MEDICAL COLLEGE. A movement has recently been made to secure for the Jefferson Medical College at Philadelphia an additional permanent endowment of \$2,000,000. The sum of \$100,000 toward this amount has already been subscribed by Mr. David Baugh, founder of the Baugh Institute of Anatomy and Biology, on condition that an equal amount should be raised on or before June 16.

The will of the late Dr. J. William White, trustee of the University of Pennsylvania, and John Rhea Barton emeritus professor of surgery, contained a bequest of \$150,000 in trust as a permanent endowment fund, of which the income was to be used for establishing a professorship of surgical research in the medical department of the University, with which the Jefferson Medical School is now affiliated.

WASHINGTON UNIVERSITY MEDICAL SCHOOL.—It is announced that the sum of \$1,000,000 has recently become available for the use of the

Washington University Medical School. Of this amount, \$350,000 has been given by Edward Mallinckrodt and John T. Milliken of St. Louis, and the remainder by the General Education Board. This sum is to be divided into two funds of \$500 each, named respectively after Mr. Mallinckrodt and Mr. Milliken, to be devoted respectively to teaching and research in pediatrics and in medicine, with full-time teaching in this department.

HONORARY DEGREES TO PHYSICIANS.—At the commencement exercises of the various American Universities during the past week it has been noteworthy that relatively few honorary degrees have been conferred on physicians. At Fordham University the honorary degree of Litt.D. was conferred on Dr. James J. Walsh of East Pepperell, Mass. At Washington University, the honorary degree of LL.D. was conferred on Dr. Theobald Smith of the Rockefeller Institute of Medical Research, and at Princeton University the honorary degree of LL.D. was conferred on Dr. Leonard Wood, Major-General of the United States Army. Dr. Theobald Smith also received the honorary degree of Sc.D. from Yale; and Dr. Arthur Dean Bevan, of Chicago, the honorary degree of A.M. At Harvard Commencement President Lowell, in recognition of Dr. Strong's recent services in Serbia, conferred upon him the honorary degree of Sc.D. in the following terms: "Richard Pearson Strong, knight errant of these latter days, armed not like the knights of old, but with the power of science, yet running greater risks than they; destroying dragons invisible to mortal eye, and saving not one or two, but hundreds and thousands by his art."

THE ESTABLISHMENT OF A NATIONAL SCHOOL OF HYGIENE.—Report from Baltimore on June 13 contains the announcement that the Rockefeller Foundation purposes to establish in that city, as an integral part of the Johns Hopkins University, a National School of Hygiene and Public Health.

The immediate need for such an institution, according to the Foundation, has been emphasized by the difficulty cities and towns have had in finding men equipped for promoting public health,—sanitary and preventive measures generally. The possibilities of usefulness of men so equipped, the Foundation pointed out, was demonstrated by the efforts of the American Red Cross in combating typhoid in Serbia and by the International Health Board of the Foundation in its campaign against hookworm disease throughout the world.

It is proposed to erect a building which will cost about \$200,000, as one of the Johns Hopkins Hospital group. The running expenses are expected to be about \$75,000 annually. The work of organizing the school will be undertaken by Dr. Welch, who is professor of pathology at

Johns Hopkins, and Dr. William H. Howell, professor of physiology. It is planned to open the school in October, 1917.

The influence of the school, it is announced, will be extended toward education of the public by exhibits, lectures and other means, with a view to a better appreciation and understanding of the importance of public and personal hygiene and in coöperative efforts for the training of public health nurses.

A NEW VOLUME OF THE OXYRHYNCHUS PAPYRI.—The eleventh volume of the *Oxyrhynchus Papyri*, now stored at Oxford, England, and recently edited by Drs. B. P. Grenfell and A. S. Hunt, and published by the Egypt Exploration Fund, is reviewed in the issue of the *Lancet* for May 13. The papyrus contains one medical manuscript, a Greek recipe for a cathartic.

"The ingredients do not present any novelty to scholars acquainted with those commonly to be found in the so-called *hiera* (mixtures) of Græco-Roman times. The text runs as follows: 'Ingredients of a purging draught: Cummin 4 drachmæ, fennel 2 dr., parsley 4 dr., costus 4 dr., mastich, 4 dr., coriander 7 dr., 21 laurel berries, nut dr., ham(?) dr., pennyroyal dr., silphium(?), salt, vinegar.' The number of drachmæ for a few of the constituents has become obliterated. The word *πέρνα*, rendered 'ham,' has probably some other meaning indicating an herb, but a comparison with the lists of ingredients in similar Greek recipes has so far failed to suggest which plant it refers to. The word rendered here silphium is *φύλλον*, which was a title at this period for silphium from Cyrene. Classic medical authors sometimes used *φύλλον* to indicate betel-nut. Silphium (*asafoetida*) is almost certainly the correct interpretation. This papyrus also contains two notes upon the healing art as follows: 'For strangury, to heal the sufferer, take the dry seed of basil-thyme, crumble it with wine of Ascalon, then drink it hot.' The Ascalon wine was celebrated above all the vintages of Syria. The second says: 'For treating wounds, take the fruit of a cypress and boil it and apply.' The remainder of this fragmentary manuscript is occupied with some partly legible portions of what appears to be an apocryphal gospel concerning healing of the sick, not only human sufferers, but angelic ones, the latter being affected with ocular disease."

MANUFACTURE OF RADIUM IN AMERICA.—The United States Bureau of Mines has recently issued a report describing the methods adopted at Denver, Col., in coöperation with the National Radium Institute, for extracting radium and other rare metals from the carnotite ores of Colorado and Utah.

"The plant was first built on an experimental

basis and began production in 1914, but it proved so successful that it was decided to increase its capacity by more than 100%, the construction of the addition being completed in February of last year. The capacity of the plant is 3½ tons of ore a day, and up to last October nearly five grams of radium element had been extracted, and approximately 2½ grams of element delivered in the form of radium bromide, of such a degree of purity as was desired by the hospitals interested in the enterprise. The average cost of one gram of radium element was \$37,599 (£7520), though the working costs of the first portion of the plant were much larger than those of the second. In addition, 31,650 pounds of uranium oxide and 11,528 pounds of vanadium oxide were extracted. The method worked out by the Bureau depends on the use of nitric acid, which is recovered as sodium nitrate, and 90% or more of the radium in the ore is extracted. The process has been tried only with American carnotite, and may not be applicable to other radium-bearing ores. The Bureau has been anxious to try pitchblende, but has found it impossible to obtain even a ton for experimental use."

EXAMINATION OF SCHOOL CHILDREN BY PRIVATE PHYSICIANS.—Up to last year, all children attending the public and parochial schools in New York City were physically examined by school medical inspectors of the Health Department's Bureau of Child Hygiene. The large number of children to be examined and the relatively small medical staff available, led the Department to adopt a plan allowing physical examination of school children either by private physicians or by the school medical inspector, at the option of the parent. This plan has now been in operation since last fall, and a brief résumé of the results recorded in the examinations made by private physicians may be of interest.

To date 18,360 cards have been returned. 7,601 in Manhattan, 2,632 in the Bronx, 7,602 in Brooklyn, 373 in Queens and 102 in Richmond. There were 94,426 admissions to schools during the term September, 1915, to February, 1916. (The admission figures for the next term will not be completed until the end of the term.) The cards returned during the first semester up to February 1 totaled 15,606, making a percentage of 16%, which represents the attitude of the parents of the school children toward this procedure, that is, one-sixth of them availed themselves of the opportunity to allow private physicians to do public health work. There was considerable variation in the percentage of cards returned, Brooklyn and the Bronx returning 21% as against 13% from Manhattan and 4% each for the outlying boroughs of Richmond and Queens.

TABLE I. PRIVATE PHYSICIANS' EXAMINATIONS.

	Number of Admissions.	Examined by Number.	Private Physicians' Percentage.
Manhattan	39,072	5363	13.
Bronx	12,410	2682	21.
Brooklyn	33,963	7186	21.
Queens	6,915	298	4.
Richmond	2,102	87	4.
Total	94,422	15,616	16.

In order to compare the results of the examinations conducted by private physicians with the results obtained by school medical inspectors the following table was prepared, showing the percentage of defects found in 16,203 children examined by private physicians and in over half a million children examined by school medical inspectors.

TABLE II.—PERCENTAGE OF PHYSICAL DEFECTS IN SCHOOL CHILDREN.

(COMPARING RESULTS OF EXAMINATIONS BY DIFFERENT GROUPS OF EXAMINERS.)

	Private Physicians', 16,203 Examina- tions.	School Medical Inspection, 1914, 308,595 Examina- tions.	1915, 278,174 Examina- tions.
Defective vision.....	3.8	8.9	8.9
" hearing.....	.93	.61	.69
" teeth.....	33.8	50.78	64.67
" nasal breath	11.7	9.35	10.0
Hyp. tonsils.....	20.8	11.72	11.6
Defective nutrition....	10.3	5.24	6.3
Cardiac defects.....	1.9	1.28	1.5
Pulmonary defects....	1.5	.19	.26
Orthopedic defects....	1.5	.60	.72
Nervous defects.....	3.9	.63	.65

Taken as a whole, there is a large degree of correspondence between the two sets of figures. The higher proportion of cardiac, pulmonary, orthopedic and nervous defects found by private physicians is readily understood when one considers the superior surroundings and greater time at the disposal of private physicians making these examinations in their offices.

If the 15,616 examinations had been conducted by the Department of Health they would have required the services of school medical inspectors and nurses as follows:

School medical inspectors at \$1200 per yr., 4	= \$4800
Nurses..... at 900 per yr., 1½	= 1350
	\$6150

As it was, they cost the Department approximately \$700 for circulars of information, examination cards, postage, etc., this constituting a saving to the Department of \$5,450.

POLIOMYELITIS IN NEW YORK CITY.—Within the past month an unusual number of cases of poliomyelitis have been reported from Brooklyn. Altogether, some two dozen cases have been reported since June first, all but one in the practice of private physicians.

According to the Health Department investigation, the cases are mild in character and have

so far occurred principally in infants and very young children. All but one of the cases are in private families and in no instances have two cases occurred in one family.

The Department requires a minimum period of quarantine of six weeks and also insists on the exclusion from school of other children in the same family. The disease is probably spread through infected nasal discharge and the Department, therefore, insists on precautions similar to those in diphtheria.

The Department of Health calls attention to the fact that diagnosis of suspected cases is aided greatly by an examination of the cerebrospinal fluid. Such examinations are made free of charge by the Health Department's laboratory. Physicians trained in the diagnosis of the disease will consult with attending physicians on request.

An extensive outbreak of infantile paralysis embracing over 2,500 cases occurred in New York in 1907 and was carefully studied by a special committee appointed by the New York Academy of Medicine.

In order to make certain that all cases of infantile paralysis are being reported, a house-to-house canvass is to be made of each block in which there is known to be a case of poliomyelitis. Every family in such a block will be visited by a nurse attached to the Bureau of Preventable Diseases, who will endeavor to find any additional suspicious cases of the disease. If she finds that such a case is under the care of a private physician, she will at once report that fact to headquarters, so that the Department of Health may take up with the physician the proper isolation, etc., to be pursued. If no physician is in attendance, a competent diagnostician will at once be detailed by the Department of Health to visit the patient and take whatever steps are necessary to prevent the spread of the disease to others.

Acting Commissioner Billings has addressed a letter to every Brooklyn physician, calling attention to the existence of poliomyelitis in Brooklyn and asking for their coöperation in controlling the disease.

Seven additional cases of poliomyelitis were reported from Brooklyn on June 20, two of them in one family. At the Health Department, the increased number reported was thought to be largely due to the newspaper publicity of the past few days. Further increase in reported cases is expected within the next few days as the result of the 2500 circular letters sent out on June 19 by Acting Commissioner Billings, to all the physicians in Brooklyn. Most of the cases thus far reported have occurred among Italians. The youngest patient in the group reported June 20 is nine months old. Three of the patients are two years old, one is three years, one four years, and another five years old. The house-to-house canvass now being conducted has not yet been finished. As far

as can be determined, the disease is practically localized in the old section of Brooklyn.

Inasmuch as only ten new cases suspected to be infantile paralysis were reported to the Department of Health in response to the personal letter sent to each Brooklyn physician, the health officials in charge of the investigation expressed the view that the outbreak was not spreading and that conditions would probably soon return to normal. Investigation of some of the suspected cases yesterday led to the inclusion of four additional true cases, making the total number in Brooklyn in the present outbreak 47, of which three have ended fatally. The Health Department expects to complete its investigation of all the suspected cases by this evening and will at once prepare a list of true cases under observation.

PREVALENCE OF MEASLES IN WASHINGTON.—The weekly report of the United States Public Health Service for June 16, states that during the week ended June 3, 1916, 409 cases of measles with one death were reported in Seattle, Wash. The epidemic of measles began in this city on February 15, 1916, since which time there have been in Seattle a total of 3921 cases of the disease, with eight deaths.

EUROPEAN WAR NOTES.

MEDICAL ASPECTS OF THE DUBLIN REVOLT.—In the issue of the JOURNAL for June 8, we commented on certain medical aspects of the Dublin revolt of April 24. The issue of the *Lancet* for May 13 contains a further statement of the casualties and of the hospital and ambulance arrangements. These details are of particular interest to those to whom Dublin is familiar as a medical center.

The official figures announce the casualties as 124 killed and 388 wounded. Irish daily papers of the date of May 6 contain the names of 160 civilians killed, probably a total of 200 is a conservative estimate. Somewhat less than this number of soldiers were killed.

"Of wounds, Jervis Street Hospital, which is in the center of Dublin, close to the General Post Office, treated some 400 cases. Mercer's Hospital, which is close to the Royal College of Surgeons, treated 130 cases of shot wounds. The City of Dublin Hospital and Sir Patrick Dun's Hospital, which are near the Northumberland Road and Mount Street Bridge area, also treated large numbers, and all the city hospitals, as well as the Dublin Castle Red Cross Hospital and the King George V. Military Hospital, received their share. The total may have been anything between 1,000 and 2,000. The great majority were, of course, civilians, including a large number of women and children. This is, perhaps, inevitable in street fighting, especially when the locality is strange to both troops and officers. The presence of a few rebels, or even of one sniper in a particular house or court, endangered the lives of several score innocent per-

sons, and in many cases those innocent suffered for the guilty. Civilians were also shot by the rebels, chiefly in the first hours of the outbreak.

"As the arms varied greatly, so also did the character of the wounds. The wounds produced by military rifles were such as the war has accustomed surgeons to, but the number of head wounds was notably large. Most of these were received by civilians who incautiously looked through their windows while the military were being fired at by rebel snipers in their neighborhood. The firearms possessed by the rebels seem to have varied within the widest limits. Many of them apparently had serviceable rifles, such as Mausers and Winchesters, but all sorts of arms were used. Many round bullets have been picked up, and it is probable that they were fired from shotguns, the bullets being substituted for shot in the cartridges. It is said that the rebels were possessed of a few machine-guns.

"It is too soon to judge of the effects of treatment, but one may hope that the results will be better than have been generally seen in military operations in France. In the first place, treatment was given speedily, and in the second the clothes of the wounded were fairly clean, and were not, as in France, sodden with infective mud.

"Some of the hospitals which gave most attention to the wounded have already been mentioned, but as fighting was taking place simultaneously in several quarters of Dublin, all the city hospitals were kept busy. In some instances the wounded could not, on account of danger in the street, gain access to the general hospitals, and the special hospitals gave accommodation willingly. In particular, the National Maternity Hospital in Holles Street received a great many civilian patients. The Rotunda Hospital, which was for some time occupied by the troops, also treated casualties and received dead bodies, while the Royal Victoria Eye and Ear Hospital took overflow patients from several institutions.

"Two urgency hospitals were opened by the local branches of the British Red Cross Society and the St. John Ambulance Association, one in Merriam Square with 20 beds, and one in Lower FitzWilliam Street with 25. They served as overflow hospitals for Sir Patrick Dun's and Mercer's Hospitals respectively. The staffs of the several hospitals worked under great difficulties. In some cases surgeons were unable to reach their own hospitals at all, and in most cases those who were able to get to their hospitals had perforce to stay there for several days. The members of the staffs of the Adelaide, Jervis Street, the Mater Misericordiae, and the Richmond Hospitals, for instance, were virtual prisoners in these institutions from Easter Monday or Tuesday to Saturday or Sunday. Many of the hospitals were repeatedly struck by bullets, but I have not heard of any casualty

in a city hospital. For a night and a day Jervis Street Hospital was in imminent danger of fire, as the great Sackville Street fire steadily approached it by the two lanes of Henry Street and Abbey Street. The same hospital was threatened by the fire of a big gun, the officer in charge of which was unaware that the building was a hospital. The Adelaide Hospital, close to Messrs. Jacobs's factory, a rebel stronghold, had to stand some rounds from a machine-gun intended for Jacobs's. As the city gas-supply was cut off early in the week operative work in the hospitals was rendered very difficult.

"The work of transporting the wounded to hospital was performed with much courage. Royal Army Medical Corps ambulances plied to the Castle and the King George V. Hospitals.

"Considerable damage was done by fire to public buildings, especially the Post Office and the Imperial Hotel. The building of the Royal College of Surgeons, which was one of the first to be occupied by the insurgents, fortunately received but slight damage. The windows overlooking St. Stephen's Green were riddled by rifle and machine gun fire, which also did some damage to the walls and furniture. Some of the Library books had been employed to form barricades."

WAR RELIEF FUNDS.—On June 24 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$128,449.26
Allied Fund	122,053.82
Serbian Fund	100,495.72
French Wounded Fund	89,998.38
Army Huts Fund	59,480.60
French Orphanage Fund	56,315.23
Armenian Fund	50,648.28
Surgical Dressings Fund	36,512.67
Facial Hospital Fund	22,357.55
Italian Fund	20,093.56
Cardinal Mercier Fund	6,892.50
Artists' Fund	2,532.62

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending June 24, 1916, there were 233 deaths reported, with a rate of 15.98 per 1,000 population, as compared with 192 and a rate of 13.38 for the corresponding week of last year. There were 34 deaths under 1 year, as compared with 30 last year, and 81 deaths over 60 years of age, against 53 last year.

During the week the number of cases of principal reportable diseases were: diphtheria, 54; scarlet fever, 20; typhoid fever, 1; measles, 320; whooping cough, 48; tuberculosis, 46.

Included in the above were the following cases of non-residents: diphtheria, 11; scarlet fever, 5; measles, 2; whooping cough, 1.

Total deaths from these diseases were: diph-

theria, 3; measles, 6; tuberculosis, 20; whooping cough, 1.

Included in the above were the following deaths of non-residents: diphtheria, 1; tuberculosis, 2.

BOSTON CITY HOSPITAL ALUMNI FIELD DAY.—The annual reunion and field day of the Boston City Hospital Alumni and house officers was held on the new South Department grounds, West Roxbury, on Tuesday, June 27. The athletic program, in charge of Dr. Paul Withington and Dr. John Woodside, began at three o'clock by a baseball game between the alumni and the house officers, followed by races, swimming events and other games. Supper was served at six o'clock.

DEBARMENT OF MILK FROM BOSTON MARKET.—Report from Rutland, Vt., on June 16 states that as the result of a recent inspection of local farms by inspectors of the Boston Board of Health, nearly forty dairies in Rutland, Bennington and Windham Counties have been forbidden to ship milk, butter or cheese to the Boston market until they have complied with various requirements of the inspectors for making changes in their barns and dairy accessories.

DISCONTINUANCE OF CAMBRIDGE MILK STATIONS.—It is announced that during the coming summer the system of milk stations which has been maintained for several years in Cambridge will be discontinued. In its stead two graduate nurses trained in infant welfare work will visit the homes of babies throughout the city. It is expected that this method will reach a larger number of patients and will help families to help themselves in the care of their children better than the system of milk stations.

MAINE HOMEOPATHIC MEDICAL SOCIETY.—The fiftieth annual convention of the Maine Homeopathic Medical Society was held at Augusta, Me., on June 13. The speakers included Dr. John A. Hayward of Portland on "History of the Maine Homeopathic Society," and Dr. John P. Sutherland, dean of the Boston University School of Medicine, who gave an address on "Hahnemann's Homeopathy."

The following officers were elected: President, Dr. L. A. Brown of Portland; vice-presidents, Dr. F. A. Ferguson of Portland and Dr. W. H. Walters of Fairfield; treasurer, Dr. W. S. Thompson of Augusta; corresponding secretary, Dr. Carrie E. Newton of Brewer; chairman of the board of censors, Dr. H. F. Marin of Bath.

OPENING OF THE BURRAGE HOSPITAL.—The Burrage Hospital on Bumpkin Island, in Boston Harbor, was reopened for its fourteenth season on Thursday, June 8.

"The association which maintains this charity is incorporated under the laws of Massachusetts, with Mr. Burrage as president of the corporation; Mrs. Alice H. Burrage, treasurer, and Al-

bert C. Burrage, Jr., clerk. Dr. Philip A. Shinn, a graduate of Tufts Medical School of last summer, who has since been on the staff of the Robert B. Brigham Hospital, has been engaged as resident physician. The surgeons are Dr. W. F. Wesselhoeft, Dr. T. E. Chandler and Dr. C. T. Howard. Dr. O. W. Chadwell is in charge of the medical department; Dr. George H. Earl is in charge of the orthopedics, and Dr. Carlisle Reed is the examining physician.

"The consulting surgeons are as follows: Dr. Charles F. Painter, dean of Tufts Medical School and chief of staff of Robert Brigham Hospital; Dr. Lloyd T. Brown of the Massachusetts General Hospital and the Robert Brigham Hospital; Dr. Mark Rogers, Dr. Robert B. Osgood and Dr. Harry C. Low, all of the Massachusetts General Hospital; Dr. Charles H. Lawrence of the Robert Brigham Hospital, Dr. E. P. Richardson, surgeon at Robert Brigham Hospital and his assistant surgeon, Dr. Richard H. Miller, who is connected also with the Massachusetts General; and Dr. Edward N. Libby of the City Hospital."

Bumpkin Island was originally granted by royal charter of King James of England to Samuel Ward, who on his death bequeathed it to Harvard College, from whom it is now leased by Mr. Albert C. Burrage.

"The hospital is in the form of the letter H, 175 feet long by 153 wide, and sets just back of the crown of the island, which contains fifty acres. It is two stories high at the front and three at the back, of light buff brick with staircases of iron to make it absolutely fireproof. In the central section, extending from the rear, is an inclined runway which, by long slopes, leads from floor to floor for the convenience of wheel chairs and the ambulance. On the first floor are the administrative offices and reception rooms, the dining rooms, kitchen, serving rooms and scullery, all large enough to provide for the utmost capacity of the building. There are four large wards on each floor, and each contains fourteen beds and smaller adjoining wards. There are a number of bathrooms. The operating room is equipped with all appliances known to modern surgery.

"On the second floor are rooms where special patients or critical cases may be placed for more careful observation. There are convalescent rooms and a library, as well. On the upper floor of the central wing are nurses' and servants' quarters with laundry, drying rooms and ample storage place in the large airy basement. All the walls of the hospital are of faced brick, enameled in white. The building is supplied with water piped from Hingham. There are gas and steam plants on the island."

The institution is essentially a convalescent hospital at which the preference is given to orthopedic cases. Only patients between the ages of two and fifteen and with non-contagious diseases are admitted.

INCIDENCE OF COMMUNICABLE DISEASE IN CHELSEA, MASS.—The annual report of the Board of Health of Chelsea, Mass., for the year 1915, states that a total of 988 cases of reportable diseases were recorded. This increase of 202 from last report is accounted for by the large number of cases of measles occurring in November and December. Diphtheria showed a decrease from 107 cases in 1914, to 70 in 1915; scarlet fever a decrease from 222 to 78; typhoid fever a decrease from 37 to 35; measles showed a great increase—from 194 to 462; 293 of these cases occurring in November and December. Ophthalmia neonatorum showed an increase from 28 to 36. Many of the cases were very mild inflammations, and some were apparently no more than an irritation following the use of the silver nitrate solution. One case of pellagra was reported from the United States Marine Hospital. There were 127 cases of all forms of tuberculosis reported. The deaths numbered 29, the least number since 1900.

HARVARD DENTAL ALUMNI ASSOCIATION.—The forty-fifth annual meeting and dinner of the Harvard Dental Alumni Association were held in Boston on June 21. The principal addresses were made by Dr. Eugene H. Smith, dean of the Harvard Dental School, and by Dr. Charles A. Brackett. The following officers were elected for the ensuing year: president, Dr. Ernest A. Chute; secretary, Dr. Charles T. Warner; treasurer, Dr. James J. O'Brien.

MASSACHUSETTS STATE NURSES ASSOCIATION.—The thirteenth annual meeting of the Massachusetts State Nurses Association was held in Boston on Tuesday of last week, June 13. The address of welcome was given by the president, Miss Sara E. Parsons.

"At 11 in the morning the League of Nursing Education met at 636 Boylston street, and had as speakers Miss Helen Wood, R.N., Miss Ellen T. Emerson and Miss M. E. P. Davis, R.N. A meeting for the organization of the section for private duty nurses was held at 585 Boylston street, at 1 in the afternoon. The councillors met at the same place at 2.30, after which followed the business meeting. Speakers included Representative John J. Kearney of the public health committee of the Massachusetts State Legislature, on 'Value of State Control of Training Schools for Nurses,' and David C. Gibson, R.N., on 'The Place of the Graduate Male Nurse in the Profession.' Discussions followed talks by Miss Ellen T. Emerson of Concord, Miss Emma M. Nichols, R.N., Miss Carrie M. Hall, R.N., and Miss Esther Dart, R.N. The committee on arrangements included Miss M. E. P. Davis, R.N., chairman, Miss Sara E. Parsons, R.N., and Miss Charlotte W. Dana, R.N."

The following officers were elected for the ensuing year: President, Miss Sara E. Parsons;

vice-president, Miss Lucia L. Jaquith; second vice-president, Miss Mary A. Meyers; recording secretary, Miss Julia A. Smith; corresponding secretary, Miss M. E. P. Davis; treasurer, Miss Esther Dart; historian, Miss Mary M. Riddle.

INVESTIGATION OF NON-PULMONARY TUBERCULOSIS.—Among the resolves (Chapt. 62) of the current session of the Massachusetts General Court may be noted the following, with reference to the investigation by the State Department of Health of non-pulmonary tuberculosis.

"Resolved, That the state department of health is hereby authorized and directed to investigate the matter of non-pulmonary tuberculosis with special reference to children and adolescents throughout the commonwealth. The department shall determine so far as possible:—

"First, the present number of cases of non-pulmonary tuberculosis in the commonwealth, and their situation.

"Second, the number of hospital beds now available for the care of such cases.

"Third, the number of additional hospital beds needed for the proper care and treatment of such cases, and the proper situation of such beds.

"Fourth, whether such additional beds, if needed, should be supplied by additions to, or enlargements of, existing general or other hospitals, or by providing new institutions designed for the purpose of treating non-pulmonary tuberculosis cases exclusively.

"Fifth, how such additions to or enlargements of general or other hospitals, or such new institutions, if they are needed, should be financed and administered.

"The said department may hold such public or private hearings as it may deem proper for the purpose aforesaid, and shall report to the next general court, on or before the second Wednesday in January, with its conclusions and such recommendations and drafts of proposed legislation as it may deem expedient. To carry out the purposes of this resolve, the department may expend a sum not exceeding five hundred dollars."

This resolve was officially approved on April 27, 1915.

MASSACHUSETTS COMMISSION FOR THE BLIND.—The recently published annual report of the Massachusetts Commission for the Blind states that of 40,259 school children examined last year in the cities of Cambridge, Lynn and New Bedford, 1,892 or 4.7 per cent. have only one-half normal vision or less. Of these children, 3.1 per cent. have never previously had their eyes examined or been provided with glasses. The important problem arises as to how many of these children should be relieved entirely of regular school work on account of their defective vision.

"The facts brought out in this year's study more than confirm the estimate, presented in our last report, that at least .1 per cent. of school children require special education in defective eyesight, or conservation of eyesight, classes. In the three cities studied this year at least 68, or .17 per cent. of the 40,259 public school children should be transferred to such special classes. It is, therefore, probably safe to estimate that fully .17 per cent. of the 382,548 school children in cities, or at least 650, require such classes. As for the 193,962 children in towns, .17 per cent., or at least 330, may be expected to need special training.

"The commission reported that during the twelve months ending Nov. 30, 1915, only one new case of total blindness from ophthalmia neonatorum was discovered in this State. The commission said that there might be other cases not unknown, but that it was safe to say that the menace from this cause of blindness has been reduced to less than 1 per cent. as a factor in bringing about loss of sight."

VENERABLE LIVING HARVARD PHYSICIANS.—The recently published annual necrology of Harvard University shows that an exceptionally large proportion of the oldest living graduates are physicians. The senior alumnus of the college is Dr. Nicholas Emery Soule of Exeter, N. H., who was born in 1824, and received the degree of A.B. in 1845. The only survivor of the class of 1846 is also a physician, Dr. Abner Little Merrill of Boston. The senior alumnus of the Lawrence Scientific School is Dr. William Lewis Jones of Atlanta, Ga., who received the degree of S.B. in 1851. The class of 1843 of the Harvard Medical School has two survivors, Dr. Kimball Hill and Dr. Edward Philippe LeProhon.

Miscellany.

CHANGES IN COST OF DRUGS.

DURING the past quarter there have been various modifications in the cost of standard drugs as affected by war conditions, sometimes resulting in an increase, and sometimes in a decrease in price. Report from New York on April 13, describes in part as follows, the condition of the drug market at that date.

"Fluctuations still are the rule in the market for drugs and chemicals. Supplies in the majority of cases are at a lower point than ever, despite all attempts at domestic production. Quicksilver and all mercury products, carbolic acid, hydrogen peroxide, quinine, chloride of lime and such alkali products as caustic soda and soda ash are the only ones which have shown tendency to decline.

"Corrosive sublimate, powdered and granular, has been reduced 50 cents, to \$2.23 and \$2.28 per pound; calomel 45 cents, to \$2.53 per pound; mercury bisulphate 55 cents to \$2.19 per pound; red precipitate, powdered and granular, 45 cents to \$2.83 and \$2.93 per pound; white precipitate 50 cents to \$2.93 and \$2.98 for the powdered and granular; blue pills, mass and powdered, 20 cents to \$1.35 and \$1.37 per pound; mercury with chalk, 20 cents to \$1.37 and \$1.39 per pound; mercurial ointment " $\frac{1}{2}$ " 35 cents to \$1.43 and \$1.44 per pound; mercury "1-3" \$1.38 and \$1.39 per pound; and citrine ointment 20 cents to 80 and 81 cents per pound.

"Sensational advances have been the rule in citric as well as in tartaric acid, tartar emetic and cream of tartar. For citric acid \$1.00 to \$1.10 per pound is asked against a maker's contract figure of 64 and 64½ cents per pound. Tartaric acid is now quoted at approximately 85 and 88 cents for the crystals and 82 cents for the powdered.

"Agar-agar or Japanese isinglass, also used as a gelatine, has advanced to 40 and 70 cents per pound, while antimony oxide is nominal at 50 cents and antimony powdered needle to 45 and 47½ cents per pound. Russian cantharides have been held up by the closing of the port of Archangel and prices have advanced to \$8.50 and \$9.00 per pound. But oil of coriander, another product of Russian origin, which has been held at \$50.00 per pound, has dropped to \$30.00 per pound from \$35.00 per pound. So far as Japanese menthol is concerned, demand has been comparatively light, and local sellers have continued to quote the comparatively low figure of \$3.15 per pound in cases and \$3.20 per pound in broken lots. The high cost of tea siftings as well as the heavy demand which has brought stocks of caffeine alkaloid in this country practically to the vanishing point has resulted in an advance to \$20.00 per pound for the alkaloid and \$9.75 per pound for the citrated. Oil of anise also had advanced to \$1.10 and \$1.15 per pound, following a rise in "star" anise seed to 25½ and 26½ cents per pound.

"All offerings of ichthylol have been withdrawn by the controlling factors, owing to their inability to procure further supplies from Mexico. Substitutes are being offered at \$6.50 against a price of \$4.50 for the original product. It is understood that Tecolutla, the only shipping port now remaining open in Mexico, has been practically closed to merchandise shipments.

"The market for all coal tar products continues to pursue an extremely anomalous course. Carbolic acid has undergone several successive declines to a basis of \$1.08 and \$1.10 per pound in drums and \$1.19 to \$1.22 per pound in pound bottles while forward contracts for deliveries late this year as well as during 1917 have been booked as low as 80 and 85 cents per pound. The domestic output has been greatly increased of late and is now estimated at from

800 to 1000 tons per month. The only sympathetic decline which is noted with carbolic acid is in aniline oil, contract prices of which have been reduced to 68 and 72 cents per pound on deliveries commencing April 1, and running for the balance of this year and the first half of 1917. The spot market shows little relaxation, however, due to the tremendous demand for this material in the dye field. A pronounced upward movement has taken place in practically all other coal tar medicinal drugs and among the new levels attained are acetanilid \$2.75 per pound; antipyrine \$55.00 and \$60.00; coumarin \$9.00 and \$10.00 per pound; phenolphthalein \$22 per pound; saccharine \$13.00 and \$13.50 per pound; benzoate of soda \$6.00 and \$6.50 per pound; benzoic acid from toluol \$7.00 per pound; and vanillin 57 and 60 cents per ounce. The salicylates have been somewhat easier, mainly owing to a falling off in demand in England where production is on the increase. The spot quotations for salicylic acid have declined to \$3.95 and \$4.00 per pound against a previous quotation of \$4.25 and \$4.50 per pound, while salicylate of soda has declined to \$3.90 and \$4.25 per pound.

"Norwegian cod liver oil has soared to new heights notwithstanding considerable improvement in the yield. As there was no carry-over from the 1915 crop and as the demand is in excess of the output, prices have advanced to \$140 and \$175 per barrel. It is understood that the great bulk of the Newfoundland output is being disposed of to England and that prices for this oil have advanced to \$120 and \$125 per barrel. A noteworthy advance also has taken place in Harlem oil to \$2.75 per gross bottles, following cablegrams advising that Dutch producers have raised their prices. For castor oil there are still no offers of any importance in the local market below 28 and 30 cents per pound, but forward offers of the number 3 oil have been noted from England at 20 cents per pound.

"The market for narcotic drugs has ruled comparatively steady under the moderate general demand from the trade and a fair export demand for morphine and codine from Europe and Latin America.

"American manufacturers of quinine continue to hold their output strongly on the basis of 75 cents an ounce. There is no weakness in this drug despite the fact that fairly large blocks have been consigned here from Holland and England."

On April 20 there was a further reduction in the cost of mercurials, and other chemicals fluctuated in different directions.

"Sugar of milk was advanced by one leading maker to 20 cents for bulk in boxes. Quinine was firm, a fair export demand having been noted. Aspirin was quoted at 88 to 90 cents an ounce in second hands. Resorcin was shaded to \$19 and \$29 per pound. An out-of-town house

advanced santonine crystals to \$37, and powdered to \$38. Castor oil declined to 21 and 22 cents per pound for 'A.A.' Offers of benzoate of soda were made somewhat more freely at \$5.50 and \$5.60 per pound. Weak holdings of chlorate of potash were eliminated, and the market was firmer at 72 and 75 cents. Benzoate of soda was obtainable at concessions, \$5.50 and \$5.60 per pound being freely quoted."

On April 22 there were further changes in market prices which were reported from New York in part as follows on that date:

"Notwithstanding lack of activity there were a number of important price alterations in the drug and chemical market on Friday, the most conspicuous feature of the market being a lowering of salicylic acid to \$3.75 and \$4.00 per pound, following freer offers. A further easing off in prices for a great many of the leading staples was noted. Citric acid was steadier with offers as low as 85 cents in some quarters. Outside lots of tartaric acid become available at 80 cents per pound. Japanese camphor also reacted somewhat following larger arrivals and slabs were obtainable at 51 1-2 and 52 cents and tablets at 53 and 53 1-2 cents. Chloroform eased off to the extent that offers appeared at 65 cents per pound. The market for antipyrine was reported lower, though some sellers continued to ask \$55 against \$45 quoted in other quarters of the trade. Other products in which the tendency was downward were domestic aniline oil and salts, carbolic acid, alum, potash, lump and powdered, epsom salts and methyl salicylate, which is obtainable on nearby contracts at \$2.25 per pound.

"Among the products in which the undertone is considered stronger are dynamite and refined glycerine, benzoic, boric, pyrogallie and oxalic acids, amyl acetate, caffeine alkaloid, formaldehyde, Norwegian cod liver oil, bay rum, which is held at a minimum of \$1.70 per pound in barrels; arsenic, gum assafoetida, orange and bergamot oils, quicksilver, saccharine, benzoate of soda, sugar of milk, Venice turpentine and Japanese vegetable wax.

"Some makers were delivering limited supplies of salicylic acid on contract at \$2.25 per pound, and the spot market was easier at \$3.75 and \$4.00. The scarcity of benzoic and boric acid was more pronounced and the small lots obtainable were held at higher premiums.

"The bulk of this year's output of Norwegian cod liver oil has been sold to Germany and the small lots remaining were held at \$200 per barrel in the primary market. The essential oils were featured by a much stronger tone in bergamot and orange, but lemon was steady, despite the reports that prices are being forced higher in Messina.

"There was considerably more buying, particularly in a small lot way, of quicksilver at the decline to \$125 per flask, and it was believed that the bottom had been touched for the time

being. Mercurials were unchanged. The market for opium was lifeless with the gum maintained on the basis of \$11.50 per pound in cases and the powdered and granular grades at \$113 per pound. Codeine and morphine met with a moderate demand at makers' quotations.

"Acetanilid was offered at \$2.30 and \$2.35; acetphenetidin at \$25 and \$26; antipyrine was in better supply and nominally lower; chloral hydrate was also reported somewhat easier. Creosote beechwood was quoted down to \$8.50 per pound, a decline of 50 cents. The scarcity of saccharine and sugar of milk was pronounced and prices were strong. Bromine was offered as low as \$3.00 for technical. The market for benzoate of soda was extremely strong and \$5.50 was inside."

Report from New York on April 26 noted few changes from conditions of the previous fortnight.

"The general situation surrounding all coal tar medicinal products shows no noteworthy relaxation for the reason that makers are still unable to obtain any quantity of the necessary intermediaries. Among the features of the market yesterday was a sharp advance in Japanese oil or camphor to 20 cents per pound following the advance in the gum. Ceylon citronella oil was advanced by some sellers to 53 1-2 cents per pound. Botanical drugs were featured by an advance in Russian powdered cantharides to \$8.50 and \$9.00 per pound, an advance in angostura bark to 40 cents and an advance in echinacea root to 20 and 21 cents following large sales at those prices.

"Cablegrams received yesterday from Yokohama stated that quotations for menthol for prompt shipment from Japan had advanced to 11s. 6d. per pound, equivalent to \$3.35 per pound spot New York. Menthol was still obtainable at \$3.15 and \$3.20 per pound in cases in the local market, but higher prices were expected in view of the higher freights on the Pacific. Salicylic acid was weaker at \$3.75 and \$3.90 per pound."

On May 2 it was reported from London that the British government has purchased the entire output of Norwegian cod liver oil for the coming season.

Further report from New York on May 4 noted a sudden recent decline in certain drug prices:

"Mercurial manufacturers announce a sharp decline of 20 to 40 cents per pound in all hard and soft preparations in consequence of the easier position of quicksilver, which is being offered at \$115 per flask of 75 pounds. Trading in the general list of drugs and chemicals was reported quieter, as far as domestic demand was concerned. Export demand, however, is reviving, and one of the bright spots yesterday was the much firmer position of chemically pure glycerine following sales to Italy of 200 cases or

6000 pounds. Formaldehyde also is in wide export demand, an order from England for one carload per month (May—December, inclusive) involving more than \$26,000, having been closed. One of the outstanding features of the situation yesterday was the weakness in salicylate of soda, spot offerings of 2000 pounds being reported from one holder at \$3.45 per pound, a concession of 45 cents over previous quotations. Holders of bichromate of potash are reported to be realizing and 64 cents was quoted in one quarter. Other sellers maintained prices for bichromate of potash at 69 and 70 cents and bichromate of soda at 50 and 53 cents.

"Silver nitrate touched the highest point on the current movement yesterday when prices were advanced 2-3 cents an ounce to a minimum of 47 3-4 cents. Offers of bromide of soda appeared at \$3.40 per pound, a concession of 10 cents, but second hands were asking higher premiums for bromide of potash and strontium. Salol was reported easier at \$9.25 per pound for May delivery. Boric acid was firm with offerings of spot goods from 14 1-2 to 17 cents per pound."

Further report from New York, on May 23, notes other fluctuations in the drug market as follows:

"There were several other weak spots in the market, offers of salicylates being reported as low as \$2.75 and \$3.00 per pound, which is a concession of 50 to 75 cents per pound. A sharp reduction was named in nitrate of silver, prices being 1½ cents an ounce lower, at 45¼ and 47¼ cents an ounce. An easing off in prices throughout the list of potash preparations carried bicarbonate of potash to \$1.40 per pound, against \$1.65; permanganate to \$1.65 and \$1.75, yellow prussiate to \$1.55 and \$1.60 and red prussiate to \$4.75. Sugar of lead and sugar of milk still are extremely scarce under heavy demand. Saccharine also is in good demand and there are orders in the market for large quantities at \$14.00 and \$14.50 per pound."

Further report from New York, on June 1, states that on that date there was a sudden rise in the cost of Norwegian cod liver oil from \$150 to \$175 a barrel, and on Newfoundland cod liver oil from \$135 to \$140.

"This advance follows cablegrams from Norway stating that the fishing season has just terminated and that of the total output of 47,600 barrels of oil this season, Germany had taken 42,000 barrels. The advance in the Newfoundland oil was based on the belief that England was about either to commandeer all stocks or place an effectual embargo on all future shipments, to guarantee a supply for home consumption. It is now an open question as to how long further supplies of the Newfoundland oil will be forthcoming, in view of the fact that England is today in dire need of this oil. Manufacturers of emulsions and other medicines who have always

depended upon Norwegian cod liver oils as their base products have had to resort to Newfoundland cod liver oil, which has consequently advanced, as above stated."

Further report from New York, on June 6, states that there has been a further reduction in the cost of glycerin to 55 cents a pound.

"One of the significant features of the market is that many of the declines which have taken place have been on comparatively small sized offers. Thus, while it is possible to buy genuine aspirin in small lots at 70 cents, a round lot of 1000 ounces could hardly be picked up at less than 75 cents, and the same situation is true in caffeine, salol, quinine, benzoate of soda, coumarin and tartaric and citric acids. Offers of hydroquinone are now quoted at \$6.00, a concession of 50 cents, and benzoate of soda is also obtainable at a 50 cents concession at \$5.50. Menthol also has declined 10 cents, and is now offered at \$2.90. Salvarsan continues scarce, and is offered only in small lots at \$10."

The scarcity of West Indian sandalwood oil has increased the price from \$3.50 to \$3.75 per pound.

TUBERCULOSIS IN BOSTON.

THE Boston Health Department has recently published a survey of conditions in this city with regard to the incidence, prevalence and mortality of tuberculosis. The following table presents a summary of the incidence and mortality of the disease during the past fifteen years:

YEAR.	POPULATION.	CASES REPORTED.	DEATHS.	DEATHS PER 10,000.	CASES UNREPORTED UNTIL DEATHS.
1900...	561,892	*815	1,407	25.06	...
1901...	568,763	1,149	1,346	23.67	...
1902...	576,049	944	1,247	21.65	...
1903...	583,335	1,355	1,227	21.03	...
1904...	590,621	2,138	1,280	20.67	695
1905...	597,908	2,168	1,224	20.47	605
1906...	613,075	2,131	1,185	19.33	406
1907...	628,242	2,623	1,138	18.11	481
1908...	643,409	2,646	1,094	17.00	400
1909...	658,576	2,905	1,072	16.28	320
1910...	673,045	3,479	1,163	17.28	328
1911...	684,811	3,137	1,067	15.58	62
1912...	712,534	3,332	1,093	15.34	40
1913...	724,493	3,195	1,064	14.69	46
1914...	736,442	2,645	1,045	14.19	40
1915...	748,431	2,775	1,034	13.82	27

* Seven and one-half months.

The above figures show a continuous decline in the incidence of tuberculosis since the Boston Health Department began its work of conflict against the infection in 1900.

"In 1900, with a population of 561,892, there were 1407 deaths from pulmonary and laryngeal tuberculosis. In 1915, with 748,341 inhabitants, the deaths were 1072. This is a decline from 25.06 per 10,000 in 1900 to 13.82 in 1915.

In 1915 there were 81 non-residents who died of tuberculosis in Boston, while 181 residents of Boston died in other places in Massachusetts, chiefly in State institutions. More residents of Boston go to hospitals in other places in the State for treatment for tuberculosis than come in from outside.

In May, 1900, the Boston Board of Health first began to require that all cases of pulmonary and laryngeal tuberculosis should be reported. The idea was new and progress was slow. The medical profession did not heed the request readily. Hesitancy in making a diagnosis or regard for the patients' feelings caused physicians to delay notification of the disease, or to neglect to report entirely. For the first four years the reported cases were less than the number of deaths. Efforts were made to correct this imperfect registration. Physicians were requested to give their reasons for failure to report. On Aug. 1, 1907, the State Board of Health declared tuberculosis to be a disease dangerous to the public health, thus making it a criminal offence for a physician or householder to fail to report. More rigorous methods were then taken. Every death from tuberculosis that was not found in the registry of reported cases was investigated, and warning was given that delinquents would be prosecuted. Flagrant offenders were brought into court, and a number fined \$50 each for failure to comply with the law. A great improvement resulted. The unreported deaths fell from 481 in 1907 to 62 in 1911, and in 1915 these had been reduced to 27. Apparently 97% of all the cases are reported. Evidently the fear of punishment accomplished what gentler measures could not do. The few cases still unreported come mostly from hospitals, where the disease is discovered only at time of death or from autopsy findings.

Of the deaths that occur annually in Boston from tuberculosis, 67% have not been reported for more than one year; 17% for not more than two years; 11% for not more than three years. The Department, for this reason, has made a general survey of all the cases in its registry up to Jan. 1, 1916, and there were 12,200 names on file. Only 5,100 were definitely located.

The number of pulmonary and laryngeal tuberculosis cases in this city is probably not more than 7,000, and certainly not less than 6,000. The number of cases is at least six times the number of the annual deaths from the disease. Owing to the difficulty in locating the patients, no more accurate estimate can be made at present.

The conditions of tuberculosis in Boston show much improvement. It is a great satisfaction to state that not a single neglected, bedridden case was found in the city. Most of the patients who would have come under this class had gone voluntarily to hospitals. Others had been removed to hospitals by order of the health department because their presence at home was a danger. At the present time practically all the

advanced cases that cannot be cared for at home can find suitable hospital accommodations. If the whole campaign against tuberculosis had accomplished no more than this, it would have well repaid the efforts expended.

"As to hospitals, the Boston Consumptives' Hospital has 410 beds, sixty of them for children; the trustees of the hospital are authorized also to hire 100 beds in private hospitals. At Long Island there are seventy-five. This gives 585 beds under city control. In addition, there are 131 in private tuberculosis hospitals. In the State hospitals at Rutland, Westfield, Lakeville, North Reading, there are 1000 beds, and in the State institution at Tewksbury, 425, giving in all, accommodations for 1425 patients. To these hospitals, Boston sends its share of patients.

"It has been estimated that as many available beds as there are deaths annually from this disease should be the minimum standard for real progress in tuberculosis work. This figure has almost been reached when the available beds in the city and State are considered."

From these data the Department derives the following conclusions, which are commended to the attention of physicians throughout the Commonwealth:

- "1. That the deaths from pulmonary and laryngeal tuberculosis have been slowly but steadily decreasing in this city.
- "2. That the cases are well reported.
- "3. That hospital accommodations are satisfactory.
- "4. That there are no neglected cases.
- "5. That the general knowledge of tuberculosis has much improved, and cases treated at home are cared for in an intelligent manner."

NOTICES.

UNITED STATES NAVY MEDICAL CORPS.

The next examination for appointment in the Medical Corps of the Navy will be held on or about August 7, 1916, at Washington, D. C.; Boston, Mass.; New York, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Great Lakes (Chicago), Ill.; Mare Island, Cal.; and Puget Sound, Wash. Applicants must be citizens of the United States and must submit satisfactory evidence of preliminary education and medical education. The first stage of the examination is for appointment as assistant surgeon in the Medical Reserve Corps, and embraces the following subjects: (a) anatomy, (b) physiology, (c) materia medica and therapeutics, (d) general medicine, (e) general surgery, (f) obstetrics. The successful candidate then attends the course of instruction at the Naval Medical School, which will begin on or about October 1, 1916. During this course he receives a salary of \$2900 per annum, with allowances for quarters, heat, and light, and at the end of the course, if he successfully passes an examination in the subjects taught in the school, he is commissioned an assistant surgeon in the Navy to fill a vacancy. Full information with regard to the physical and professional examinations, with instructions how to submit formal application, may be obtained by addressing the Surgeon General of the Navy, Navy Department, Washington, D. C.

W. C. BRAISTED,

Surgeon General, U. S. Navy.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE WEEK ENDING JUNE 17, 1916.

June 12, Assistant Surgeon M. R. C., H. A. Royster, commissioned from May 15, 1916.

June 13, Surgeon F. L. Benton, detached Naval Station, Key West, Fla., to duty with expeditionary forces, Santo Domingo.

P. A. Surgeon W. J. Zalesky, to Naval Recruiting Station, Brooklyn, N. Y.

Assistant Surgeon V. H. Carson, detached Navy Recruiting Station, New York, N. Y., to duty with expeditionary forces, Santo Domingo.

June 17, Assistant Surgeon John Harper, detached Navy Yard, New York, N. Y., to Minnesota.

Assistant Surgeon Arthur Freeman, to Navy Yard, New York, N. Y.

WORCESTER PATRIOTIC PARADE.—The physicians of Worcester and vicinity are invited to march in a body in the patriotic parade to be held in that city on July 4, 1916. It is hoped that each hospital will be represented by a float or by marchers or by both, thus making a medical division. Every physician taking part in this parade is to wear a straw hat, a white band with a green cross on the sleeve and carry a small flag. All who are willing to participate in this demonstration should immediately notify the secretary of the undersigned committee. Sleeve bands and flags will be ordered in accordance with these notifications. Announcement of further details will be published in the daily papers.

Committee, SAM'L B. WOODWARD	HOMER GAGE
JOHN T. DUGGAN	M. F. FALLON
J. K. WARREN	FRED'K H. BAKER
ERNEST L. HUNT,	Secretary

WANTED: MEDICAL MEN FOR THE SERVICE IN LONDON. There is need for 40 men to serve in the London war hospitals. They are needed for six months' service. Transportation and board and lodging will be provided by the British government. Recent graduates in medicine can be used, as well as men with longer experience, as general practitioners, internists, or surgeons. For further information apply to Dr. R. C. Cabot, 1 Marlborough Street, Boston, Mass., or Dr. H. A. Christian, Peter Bent Brigham Hospital, Boston, Mass.

APPOINTMENTS.

HARVARD MEDICAL SCHOOL.—The following physicians have been appointed associates for the ensuing academic year:

Farrar Cobb, A.M., M.D. (Surgery).

Frederic Jay Cotton, A.M., M.D. (Surgery).

William Edward Faulkner, A.B., M.D. (Surgery).

Joshua Clapp Hubbard, A.B., M.D. (Surgery).

Daniel Fiske Jones, A.B., M.D. (Surgery).

Fred Bates Lund, A.M., M.D. (Surgery).

Abraham Myerson, M.D. (Neuropathology).

RECENT DEATHS.

DR. ELLIS V. FANNING, who died at Nantucket, Mass., on June 16, was a graduate of the Harvard Dental School in 1901 and had practised his profession at Brockton, Mass., since that time. He is survived by three children.

DR. EUGENE ALBERT GILMAN, of Dorchester, died at his home June 17, aged 74 years. He was a graduate of Harvard Medical School in 1872 and joined the Massachusetts Medical Society in that year from South Boston. He was retired in 1907.

DR. FRANK D. GRAY, president of the New Jersey Medical Society, died in Jersey City on June 11. He received the degree of M.D. from New York University in 1883.

Shapira

THE BOSTON Medical and Surgical JOURNAL

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SUPPLEMENTARY

INFORMATION RECEIVED SINCE FINAL REVISION.

Beebe, Theodore Chapin.....	Address unknown.
Bianco, Joseph Anthony.....	Resigned, Feb. 2, 1916.
Broderick, Thomas Frederick, Jr.....	From Boston to Brighton (Boston). Office Boston, 483 Beacon St.
Burns, Newell Bly.....	North Wilmington (New P. O.), State Sanatorium.
Butterfield, George Kittredge.....	From Reed's Ferry, N. H., to Worcester, 223 Sallis- bury St.
Cain, William George.....	Resigned, Feb. 2, 1916.
Carleton, Charles Greenleaf.....	Retired, 1916.
Carley, Margaret Elizabeth.....	Address unknown.
Chamberlin, Harold Augustus.....	From Hartford, Conn., to North Abington (Abington), 301 Plymouth St.
Claffey, John McMahon.....	Springfield, 183 North Main St.
Clark, Harry Ainsworth.....	Address unknown.
Clark, James Colby Dorr.....	Resigned, Feb. 2, 1916.
Coon, William Hall.....	From Haverhill to Springfield, 42 Cherryvale Av.
Dearborn, John George.....	Died, January 3, 1916.
Dezell, Frank Burr.....	(Not Degell), Lynn, 293 Euclid Av.
Dodd, John Edward.....	From Holliston to Framingham, 33 Union Av.
Douglass, John Abbott.....	Died, Feb. 4, 1916.
Evans, Miner Harlow Amos, Jr.,.....	Dorchester. Office Boston, 248 Newbury St.
Eveleth, Edward Smith.....	Died, January 25, 1916.
Fisher, Chester Irving.....	Retired, 1916.
Haché, Henry Clement.....	Died, January 7, 1916.
Haley, William Thomas.....	From Boston to Marblehead. Office Boston, 156 Huntington Av.
Holt, Charles Herbert.....	Pawtucket, R. I., Masonic Building.
Howe, George Plummer.....	From Lawrence to Boston, 29 Gloucester St.
Johnson, Herbert Shattuck.....	Resigned, Feb. 2, 1916.
Johnson, Walter Sydney.....	Los Angeles, Calif., 1767, North Adams St.
Jones, Lyman Asa.....	From North Adams to Swampscott.
Jones, Frederick Ellis.....	Quincy, 1150 Hancock St.
Juddins, Charles Louville Mason.....	Lynn. Office Boston, 149 Newbury St.
Kelly, Michael.....	Resigned, Feb. 2, 1916.
Langnecker, Harry Leslie.....	Resigned, Feb. 2, 1916.
La Rivérier, Athanase de Charette Evariste.....	New Bedford, 1394 Acushnet Av.
Lawrence, Nellie Louise.....	Louisville, Ky., 513 West St. Catherine St.
Laws, Sophie Goudge.....	Resigned, Feb. 2, 1916.
Little, John Mason, Jr.,.....	From Boston to St. Anthony, N. F.
Loewe, Leonard Joseph.....	From Haddam to Higganum, Conn.
McCarthy, Francis Patrick.....	From Mattapan to Milton. Office Boston, 394 Marl- boro' St.
McFee, William David.....	Haverhill. Office Boston, 149 Newbury St.
McGrath, Bernard Francis.....	From Rochester, Minn., to Milwaukee, Wis., Mar- quette School of Medicine.
Messinger, Henry Carlton.....	Providence, R. I., 170 Broad St.
Monty, Adelbert Howard.....	Address unknown.
Moore, George Albert.....	Brockton, 31 West Elm St.
Morse, Henry Lee.....	From Boston to Medfield, North St.
Nagle, Evelyn Wyman.....	Resigned, Feb. 2, 1916.
Nason, Osman Cleander Baker.....	From Cambridge to Rutland, State Sanatorium.
Neff, Irwin Hoffman.....	Pondville (New P. O.), State Hospital.
Noble, Alfred Ira.....	Died January 20, 1916.
Parker, Munroe Albert.....	Resigned, Feb. 2, 1916.
Patterson, Alice Maria.....	From South Hadley to Hathorne (Danvers), State Hospital.
Pettingill, Olin Sewall.....	From Wallum Lake, R. I., to Hebron, Me., Maine Sanatorium.
Porter, Charles Allen.....	Boston, 116 Beacon St.
Pratt, Mason Ross.....	From Syracuse, N. Y., to Baltimore, Md., Hebrew Hospital.
Quennell, Willard Leslie.....	Resigned, Feb. 2, 1916.
Richards, Caroline Maria.....	From New York, N. Y., to Annisquam (Gloucester).
Rogers, John Andrews.....	From Lowell to Nashua, N. H., 63 Main St.
Rowe, George Howard Malcolm.....	Died, January 30, 1916.
Smith, Charlotte Stewartson.....	Manchester, N. H., 46 Hanover St.
Smith, Theobald.....	Resigned, Feb. 2, 1916.
Stevens, Harold Elmer Ellsworth.....	Lewiston, Me., 671 Main St.
Stowell, Edmund Channing.....	} From Dublin, N. H., to Marlboro, N. H.
Stowell, Sarah Russell.....	
Sullivan, John Joseph.....	(Restored), Lawrence, 316 Bay State Bldg.
Tompkies, James Scott.....	From Rochester, Minn., to Dallas, Texas, 927 St. Joseph St.
Trow, William Marshall.....	Died, September 13, 1913.
Vosburgh, Stephen Earle.....	Resigned, Feb. 2, 1916.
Williams, Harry Edwin.....	Resigned, Feb. 2, 1916.
Webb, Harold Wendell.....	Arlington, 409 Massachusetts Av.
Wells, Abner Toothaker.....	From Canton, Ohio, to Kendallville, Ind., 208 South Morton St.
Wentworth, Mark Hunking.....	From Boston to Concord, 26 Lexington Road.
White, James Clarke.....	Died, January 5, 1916.
Wilkins, George Clarence.....	Manchester, N. H., 402 The Beacon.

Massachusetts Medical Society

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1892 Goodale, George Lincoln, 5 Berkeley St., Cambridge, Mass.

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JANUARY 1, 1916

NOTE.—The date preceding the name is that of admission. A date following, preceded by a †, denotes year of retirement. The first name of city or town is the legal residence; the street and number are the office address.

A letter in place of a given name not followed by a period is not an initial. It is a letter adopted by the individual instead of a name to distinguish him or her from others, or for the sake of euphony.

A

- 1884 Abbe, Alanson Joseph.....Fall River. 375 Rock St.
1910 Abbe, Elizabeth Morrison...Roxbury (Boston).
45 Dale St.
1895 Abbe, Frederick Randolph...Dorchester (Boston).
15 Sayward St.
1911 Abbot, Charles Edward....Andover. 70 Main St.
1892 Abbot, Edward Stanley....Waverley (Belmont).
McLean Hospital.
1903 Abbot, Florence Hale.....Newton. 419 Waverley Av.
1913 Abbott, Charles Roger....Clinton. 123 High St.
1894 Abbott, Howard Edwin....Lynn. 54 Park St.
1880 Abbott, Stephen Wendell...Lawrence. 103 Summer St.
†1915
1891 Achorn, John Warren.....Pine Bluff, N. C.
1911 Achorn, Ralph Chase.....Boston. 673 Boylston St.
1909 Adamian, Parnag Adam....Worcester. 55 Laurel St.
1911 Adams, Charles Baker....Springfield. 431 Main St.
1894 Adams, Charles Sumner....Wollaston (Quincy).
62 Brooks St.
1906 Adams, Charles Waldron...Cambridge. 322 Broadway.
1887 Adams, Edwin Boardman...Springfield. 423 Main St.
1880 Adams, George Edwin....Worcester. 974 Main St.
1884 Adams, Herbert William...Dorchester (Boston).
744 Dudley St.
1898 Adams, John.....Roxbury (Boston).
1637 Tremont St.
1903 Adams, John Dresser.....Boston. 261 Beacon St.
1873 Adams, John Quincy....Amesbury. 106 Main St.
1910 Adams, Letitia Douglas....Winthrop. 139 Cliff Av.
1891 Adams, Walter Henry....Northampton. 34 Bridge St.
1899 Adams, William Carlton...East Taunton (Taunton).
168 Middleboro St.
1904 Adams, Zabdiel Boylston...Brookline. Office, Boston.
166 Newbury St.
1912 Addelson, Nathan.....Roxbury (Boston).
548 Warren St.
1907 Adler, Herman Morris....Roxbury (Boston).
74 Fenwood Rd.
1910 Adriance, Vanderpoel....Williamstown. Main St.
1867 Ahearne, Cornelius....Lynn. 21 Church St.
Augustus †1906
1891 Ahearne, Cornelius....Salem. 83 Essex St.
Augustus, Jr.
1915 Ahlstrom, Hjalmer.....Quincy. 119 Garfield St.
1894 Albee, George Macdonald...Worcester. 1159 Main St.
1915 Albee, Kenneth Field....Weston. Central Av.
1915 Alcuazar, Isaac.....Roxbury. 72 Perrin St.
1903 Alexander, Thomas Branch Scituate Harbor
(Scituate). Central St.
1900 Alfred, James.....Brockton.
591 North Main St.
1913 Allard, Carlton Eugene....Boston. 419 Boylston St.
1913 Allen, Arnold Noble.....Roslindale (Boston).
22 Conway St.
1884 } Allen, Bradford.....Nashua, N. H. 9 Main St.
1906 }
1892 Allen, Carl Addison.....Holyoke. 16 Fairfield Av.
1899 Allen, Clarence Jean....Worcester. 33 Church St.
1909 Allen, Fred Harold.....Holyoke. 644 Dwight St.
1901 Allen, Freeman.....Boston. 200 Beacon St.
1885 Allen, Gardner Weld....Boston. 419 Boylston St.
1913 Allen, George Edgar....Lynn. 263 Chatham St.
1903 Allen, Granville Stevens...Lawrence. 3 State St.
1901 Allen, Horatio Cushing....New Bedford. 11 Eighth St.
1898 Allen, Seabury Wells....York Harbor, Me. Office,
Boston. 509 Beacon St.
1903 Allen, William Howard....Mansfield. 70 N. Main St.
1911 Ailing, Marshall Louis....Lowell. 9 Central St.
1914 Allison, Carl Edwin.....Somerville. 241 Elm St.
1911 Almy, Thomas.....Fall River. 140 Rock St.
1893 Amadon, Arthur Frank....Boston. 543 Boylston St.
1890 Ames, John Lincoln.....Boston. 87 Chestnut St.
1915 Anderson, Victor Vance....Cambridge 1000 Mass. Av.
1898 Andrews, Anna Judkins....Boston. 30 Huntington Av.
1914 Andrews, Benjamin Franklin Worcester. City Hospital.
1897 Andrews, Edward Austin...Newton Center (Newton).
14 Institution Av.
1907 Andrews, Frederick Francis Revere. 94 Beach St.
1899 Andrews, Harold Virgil....Boston. 1053 Boylston St.
1915 Andrews, Oren.....Gardner. 7 East Broadway.
1904 Andrews, Robert Eaton....Cambridge. 4 Brattle St.
1888 Anthony, Francis Wayland Bradford (Haverhill).
Office, Haverhill.
50 Merrimack St.
1910 Anthony, George Chenery...Wellesley.
Denton Road—West.
Springfield.
1898 Anthony, Jeremiah Christopher 150 Chestnut St.
1874 Appleton, William.....Boston. 74 Beacon St.
1912 Archambault, Lionel Haverhill. 94 Emerson St.
Maximilian
1915 Arey, Harold Carleton....Worcester. State Hospital.
1906 Arkin, Louis.....Boston.
366 Commonwealth Av.
1891 Arnold, Horace David....Boston.
520 Commonwealth Av.
1905 Ascher, Joseph.....Roxbury (Boston). Office,
Boston. 344 Hanover St.
1912 Ash, James Earle.....Cambridge, Office,
Roxbury (Boston).
240 Longwood Av.
1895 Ash, John Henry.....West Quincy (Quincy).
237 Copeland St.
1908 Atchison, Charles Moran...New Bedford. 94 Fourth St.
1894 Atkinson, Lizzie Daniel West Newton (Newton).
Rose 1720 Washington St.
1905 Atwater, James Billings...Westfield. 108 Elm St.
1904 Atwood, Abel Wilson....Worcester. 744 Main St.
1915 Atwood, Blanche Louise...Whitman. 82 Pleasant St.
1883 Atwood, Charles Augustus Taunton.
15 West Britannia St.
1900 Atwood, Charles Fenner....Arlington. 821 Mass. Av.
1881 Atwood, Frank Sumner....Salem. 125 Federal St.
1892 Atwood, George Manley...Bradford (Haverhill).
127 Main St.
1894 Auger, Louis Lemaitre....Worcester. 104 Brattle St.
1891 August, Albert.....Cambridge. 51 Brattle St.
1887 } Austin, Arthur Everett....Boston. 110 Marlboro' St.
1912 }
1915 Austin, James Cornelius Spencer. 176 Main St.
1903 Averell, Charles Wilson....North Reading.
1896 Averill, George Goodwin...Waterville, Me.
47 Bedington, St.
1882 Averill, Jesse Howes....Campello (Brockton).
1148 Main St.
1910 Ayer, James Bourne.....Boston. 518 Beacon St.
1884 Ayer, Silas Hibbard....Boston. 318 Shawmut Av.
1896 Ayer, Thomas Herbert....Westborough.
50 West Main St.
1914 Ayers, Charles Eaton....Worcester. 311 Main St.
1914 Ayres, Harold Winslow....West Somerville (Somerville). 403 Highland Av.

B

- 1878 Bacon, Jonas Edward....Brockton. 101 Main St.
1900 Bacon, Newton Samuel....Cambridge. 1688 Mass. Av.

- 1899 Bacon, Theodore Spaulding. Springfield. 67 Maple St.
 1899 Badger, George Sherwin. Boston.
 Clarke 48 Hereford St.
 1903 Baff, Max. Worcester
 141 East Central St.
 1913 Bagg, Edward Parsons, Jr. Holyoke. 243 Linden St.
 1915 Bagnall, Edgar Stanley. Roslindale (Boston).
 1 Jeannette Pl.
 1904 Bail, John Warren. Brookline. 1677 Beacon St.
 1881 Bailey, Charles Hardy. Gardner
 39 East Broadway.
 1905 Bailey, Frederick James. Dorchester (Boston).
 40 Hancock St.
 1893 Bailey, George Guy. Ipswich. 49 Central St.
 1894 Bailey, Marshall Henry. Cambridge. 1569 Mass. Av.
 1898 Bailey, Walter Channing. Boston. 506 Beacon St.
 1906 Bain, John Baxter. Lawrence. 348 Haverhill St.
 1910 Baker, Chester Stoye. Lowell. 40 Middlesex St.
 1883 Baker, David Erastus. Newtonville (Newton).
 227 Walnut St.
 1914 Baker, Donald Vinton. Boston. 49 Gloucester St.
 1892 Baker, Frederick Herbert. Worcester. 4 Linden St.
 1914 Baker, Harold Woods. Boston. 49 Gloucester St.
 1882 Baker, Harry Beecher. Dighton. Office, Taunton.
 59 Main St.
 1910 Baker, Leonard Allen. State Farm (Bridgewater).
 1899 Baker, Lewis Forrester. Fitchburg. 454 Main St.
 1903 Baker, Osmyn. Address unknown.
 1903 Baketel, Roy Vincent. Methuen.
 Odd Fellows' Bldg.
 1906 Balboni, Gerardo Monari. Boston. 9 Prince St.
 1891 Balch, Franklin Greene. Boston. 279 Clarendon St.
 1892 Balcom, George Franklin. Swanzey, N. H.
 1911 39 Main St.
 1911 Balcom, Kenneth Ira. Worcester. 112 Lincoln St.
 1914 Baldwin, Edith Elizabeth. Springfield.
 50 Buckingham St.
 1888 Baldwin, Frederick William Danvers. 25 Conant St.
 1895 Baldwin, Herman Trost. Chestnut Hill (Newton).
 96 Middlesex Rd.
 1896 Baldwin, Sanford Oscar. Framingham. 11 Union Av.
 1912 Bal, Arthur Nelson. Northampton.
 State Hospital.
 1907 Ballou, Ambrose Roche. Dorchester (Boston).
 327 Neponset Av.
 1901 Balmer, William Edward. Whitinsville (Northbridge).
 Cottage St.
 1886 Bancroft, Edward Erastus. Wellesley.
 604 Washington St.
 1891 Bancroft, George Andrew. Natick. 33 West Central St.
 1877 Bancroft, Winfred Baxter. South Boston (Boston).
 597 Broadway.
 1898 Bangs, Charles Howard. Lynn. Office, Boston.
 149 Tremont St.
 1906 Bannon, John Hugh. Lawrence. 457 Essex St.
 1905 Bardwell, Frederick Albert. Roxbury (Boston).
 2 St. James St.
 1908 Barker, Williston Wright. Dorchester (Boston).
 4 Lyndhurst St.
 1892 Barnes, Francis John. Cambridge. 67 Brattle St.
 1899 Barnes, Harry Aldrich. Brookline. Office, Boston.
 205 Beacon St.
 1872 Barnes, Henry Jabez. Northborough. Office,
 1913 Boston. 429 Beacon St.
 1900 Barnes, James Arthur. Worcester. 390 Main St.
 1906 Barnes, William Lester. Lexington. 362 Mass. Av.
 1905 Barney, James Dellinger. Boston. 374 Marlboro' St.
 1914 Barney, Willis Oliver. Boston.
 360 Commonwealth Av.
 1910 Barnum, Francis Goodell. Hyde Park (Boston).
 16 Maple St.
 1913 Barone, Joseph. 282 Hanover St.
 1895 Barré, Joseph Aladin. Fall River.
 1555 Pleasant St.
 1900 Barrell, Charles Sewall. Boston. 425 Beacon St.
 1890 Barrell, Mary Elizabeth. Worcester. 904 Main St.
 1907 Barrett, Edward William. Medford. 34 Washington St.
 1904 Barrett, Michael Francis. Brockton. 231 Main St.
 1913 Barrier, Emile August. Allston (Boston).
 Office, Boston.
 360 Commonwealth Av.
 1906 Barron, Elmer Walter. Malden. Office, Boston.
 520 Commonwealth Av.
 1908 Barrows, Sterling. Worthington.
 1901 Barry, Emmett William. Whitinsville (Northbridge).
 1908 Barry, James Henry. Roxbury (Boston).
 2990 Washington St.
 1915 Barry, Rolla Grant. Worcester. State Hospital.
 1906 Barstow, Andrew Thaddeus. Boston. 27½ Mass. Av.
 1899 Bartlett, Charles Watson. Marshfield. Main St.
 1909 Bartlett, Fred A. Atlantic (Quincy).
 62 Billings Rd.
 1895 Bartlett, Oliver Leslie. Pittsfield. 73 North St.
 1902 Bartlett, Philip Challis. Newton Highlands (New-
 ton). Office, Boston.
 583 Beacon St.
 1905 Bartlett, Walter Oscar. Roxbury (Boston).
 Office, Boston.
 390 Commonwealth Av.
 1903 Bartley, John Joseph. Lawrence. 334 Haverhill St.
 1906 Bartol, Edward Francis. Milton. 6 Reedsdale Rd.
 Washburn
 1890 Bartol, John Washburn. Boston. 3 Chestnut St.
 1871 Barton, Chester Manley. Hatfield.
 1906
 1900 Barton, John Alfred. Fitchburg. 43 Summer St.
 1869 Bassett, Elton James. 1910 Taunton. 11 Cedar St.
 1911 Batchelder, Hollis Goodell. Dedham. Office, Boston.
 520 Beacon St.
 1897 Batchelder, William. Dorchester (Boston).
 Burdett 163 Washington St.
 1895 Bateman, Frank Elliot. Somerville.
 163 Highland Av.
 1915 Bates, Charles Atwood. Ashburnham.
 1889 Bates, Everett Alanson. Springfield. 57 Chestnut St.
 1907 Bates, Lewis Beals. Ancon, Canal Zone, Pana-
 ma, Ancon Hospital.
 1897 Bates, Walter Simpson. Barre. South St.
 1879 Battershall, Joseph Ward. Attleborough.
 18 North Main St.
 1911 Battershall, Mary Hannah Attleborough.
 Wolfenden 18 North Main St.
 1912 Bauer, Louis Hopewell. U. S. Army.
 1912 Baum, Ewald George. Natick. 17 West Central St.
 1914 Baxter, Clarence Pennell. Topsfield.
 1884 Baxter, Edward Hooker. Hyde Park (Boston).
 19 Webster St.
 1903 Beal, Howard Walter. Worcester. 452 Main St.
 1913 Beale, Samuel Marsden, Jr. Sandwich.
 1897 Beals, Arthur Loring. Brockton. 106 Main St.
 1912 Bean, Charles Franklin. West Medford (Medford).
 Kingsbury 51 Harvard Av.
 1896 Bean, Charles Pierce. Boston. 426 Mass. Av.
 1906 Beauchamp, Joseph Octave. Chicopee Falls (Chicopee).
 Office, Springfield.
 310 State St.
 1908 Beaulieu, Elmer Joseph. Whitman. Washington St.
 1906 Beaulieu, Francis Xavier. Taunton. 357 Bay St.
 1899 Beckley, Chester Charles. Lancaster.
 1890 Bedard, Joseph Armand. Lynn. 26 Ocean St.
 1901 Beebe, Theodore Chapin. Boston. 416 Marlboro' St.
 1901 Beede, M Josephine. Roslindale (Boston).
 10 Conway St.
 1907 Beeley, Leon Gage. Lawrence. 145 Haverhill St.
 1914 Behrman, Roland Augustus. Mattapan (Boston).
 249 River St.
 1914 Bell, Clarence John. Wellfleet.
 1914 Bell, Conrad. Waltham. 820 Main St.
 1914 Bell, Richard Dana. Somerville. 26 Bow St.
 1876 Bell, William Appleton. Somerville. 26 Bow St.
 1906 Bellehumeur, David. Lowell.
 Stanislaus 813 Merrimack St.
 1873 Bemis, Charles Albert. 1909 West Medway (Medway).
 1875 Benner, Burnham Roswell. Lowell. 62 Sixth St.
 1898 Benner, Herbert Orrey. Framingham. 45 Irving St.
 1903 Benner, Richard Stanwood. Springfield. 25 Maple St.
 1906 Bennett, Hamlin Perley. Lynn. 41 Lewis St.
 1902 Bennett, William. Hyde Park (Boston).
 Hurlburt 1349 River St.
 1898 Benson, Charles Sweetser. Haverhill. 50 Merrimack St.

- 1898 Berg, Tekla Amalia.....Lynn. 1 Atlantic St.
Josefina
- 1903 Bergin, Stephen Albert.....Worcester. 33 Portland St.
1889 Bernard, Barnard.....South Boston (Boston).
Lecherzack 195 Dorchester St.
440 Warren St.
- 1914 Berry, Charles Francis.....Boston.
541 Commonwealth Av.
- 1908 Berry, Gordon.....Worcester. } 19 Elm St.
1896 Berry, John Cutting †1912 Worcester. }
- 1890 Berry, Lauriston M. †1908 Junction, Wyoming.
1909 Berry, William Christopher. Jamaica Plain (Boston).
Office, Boston.
- 1901 } Bertrand, Alexis Everiste. } Lowell.
1914 } 10 East Merrimack St.
- 1908 Besse, Frank Adelbert.....Orleans. Main St.
1907 Bessey, Earle Emerson.....Waban (Brookline).
Office, Boston.
- 1883 Best, Joseph George.....Greenfield. 473 Main St.
1905 Bianco, Enoch Anthony.....East Boston (Boston).
34 Gladstone St.
- 1901 Bicknell, Ralph Emerson.....Swampscott. 148 Burrill St.
1909 Bieberbach, Walter Daniels. Worcester. 31 Pleasant St.
1907 Bier, Max Daniel.....Lawrence. 85 Concord St.
1906 Bigelow, Alice Houghton.....Jamaica Plain (Boston).
14 Warren Sq.
- 1882 Bigelow, Charles Edwin.....Leominster. 2 Park St.
1905 Bigelow, Edward Bridge.....Worcester. 61 Pearl St.
1883 Bigelow, Enos Hoyt.....Framingham Center.
(Framingham).
P. O. Box 213.
- 1913 Bigelow, James Bernard.....Holyoke. 61 Pearl St.
1874 Bigelow, William Sturgis. Boston. 56 Beacon St.
1904 Binford, Ferdinand.....Hyannis (Barnstable).
Augustus Main St.
- 1903 Binney, Horace.....Boston. 205 Beacon St.
1894 Birge, Ella Freeman.....Provincetown.
1883 Birge, William Spafard.....Provincetown. Pearl St.
1885 Birmingham, Robert.....Lawrence. 170 Salem St.
Michael
- 1909 Birnie, John Mathews.....Springfield. 6 Chestnut St.
1914 Bisbee, Ernest Sydney.....Boston. 777 Tremont St.
1878 Bixby, Josiah Peet.....Woburn. 55 Elm St.
1910 Bixby, Oliver Edward.....Lynn. 189 Lewis St.
1901 Blaine, Walter Edward.....Mattapoisett. 72 Main St.
1900 Blair, George Kenniston.....Salem. 311 Essex St.
1897 Blair, Orland Rossini.....Springfield. 580 State St.
1904 Blair, Orrin Curtis.....Lynn. 79 N. Common St.
1882 Blaisdell, George Warren.....Manchester. 21 Union St.
1913 Blaisdell, John Harper.....Lynn. Office, Boston.
111 Newbury St.
- 1904 Blake, Allen Hanson.....West Somerville (Somerville). 117 Elm St.
1868 Blake, Clarence John.....Boston. 226 Marlboro' St.
1915 Blake, Francis Gilman.....Roxbury (Boston).
P. B. Brigham Hospital.
- 1906 Blake, Gerald.....Boston. 212 Beacon St.
1888 Blake, Harrison Gray.....Woburn. 512 Main St.
1915 Blake, James Eddy.....Roslindale (Boston).
3 South Fairview St.
- 1890 Blake, John Baptist.....Boston. 657 Boylston St.
1861 Blake, John George.....Boston. 212 Beacon St.
1901 Blake, Le Grande.....Riverside. R. I.
317 Bullock Point Av.
- 1898 Blakely, David Newton.....Brookline. Office, Boston.
535 Beacon St.
- 1882 Blanchard, Benjamin.....Brookline.
Seaver 432 Washington St.
- 1913 Blanchard, Paul Drake.....Lowell. 226 Merrimack St.
1902 Blanchard, Randall.....Pittsfield. 7 North St.
- Howard
1909 Blanchard, William.....Quincy.
Herbert Fore River Hospital.
- 1912 Blanchette, William Henry.....Fall River.
142 Brighton St.
- 1904 Blenkhorn, James.....Stoneham. 301 Main St.
1910 Bliss, George Danforth.....Dorchester (Boston).
508 Washington St.
- 1905 Bliss, George Stephen.....Fort Wayne, Ind. Ind. Sch.
Feeble-Minded Youth.
- 1897 Bliss, Jesse Leonti.....Holyoke. 231 Iligh St.
1893 Bliss, Wilbur Howard.....Shrewsbury. Main St.
1872 Blodgett, Albert George Ware. 20 Park St.
†1911
1871 Blodgett, Albert Novatus Boston. 51 Mass. Av.
†1913
- 1898 Blodgett, John Hammond.....Boston.
390 Commonwealth Av.
- 1912 Blodgett, Stephen Haskell.....South Lincoln (Lincoln).
Office, Boston.
419 Boylston St.
- 1908 Blood, George Willard.....Fall River. 723 Middle St.
1874 Blood, Robert Allen †1912 George's Mills, N. H.
1868 Boardman, William Boston. 388 Marlboro' St.
Elbridge †1909
- 1906 Boardman, William Parsons. Boston. 388 Marlboro' St.
1885 Boardman, William Sidney.....Boston. 63 Mt. Vernon St.
1912 Bodwell, William Mortimer. Framingham.
2 Lexington St.
- 1915 Boehm, Julius Benjamin.....Roxbury (Boston).
P. B. Brigham Hospital.
- 1910 Bogan, Frederick Leon.....Dorchester (Boston).
Office, Boston.
514 Commonwealth Av.
- 1878 Boland, Elisha Shepard.....South Boston (Boston).
809 Broadway.
- 1912 Boland, Lawrence Francis. Welch, W. Va.
Miners' Hospital, No. 1.
- 1871 Bolles, William Palmer Roxbury (Boston).
†1913 466 Warren St.
- 1891 Bolton, Charles James.....Somerville. 26 Chauncy St.
1910 Bond, Sarah Adams.....Jamaica Plain (Boston).
Office, Boston.
- 1904 Bond, Walter Legrand.....West Somerville (Somerville). 322 Highland Av.
- 1889 Bond, Willis George.....Revere. 76 Beach St.
1915 Bone, Herman David.....Gardner. 3 Cross St.
1903 Bonnar, James Miller.....New Bedford.
186 Pleasant St.
- 1914 Bonelli, Raymond Peter.....Boston. 276 Hanover St.
1911 Bonneville, Alfred Joseph.....Hatfield. 43 Main St.
1901 Bonney, Charles Austin, Jr.....New Bedford.
67 Bedford St.
- 1903 Bonney, Robert.....East Boston (Boston).
7 Princeton St.
- 1897 Boom, Augustus Keeper.....Adams. 51 Park St.
1908 Boos, William Frederick.....Brookline. Office, Boston.
374 Marlboro' St.
- 1877 Booth, Edward Chauncey Somerville. 40 Boston St.
†1915
- 1907 Boothby, Walter Meredith.....Boston.
508 Commonwealth Av.
- 1902 Borden, Charles Richardson Brookline. Office, Boston.
Cobb 520 Commonwealth Av.
- 1906 Borden, George Edward.....Adamsville, R. I.
1893 Bossidy, John Collins.....Boston. 419 Boylston St.
1911 Bostick, Warren John.....West Springfield.
376 Main St.
- 1897 Bottomley, John Taylor.....Boston. 165 Beacon St.
1897 Boucher, George Alphonse.....Brookton. 20 Clinton Av.
- 1905 Boutwell, Horace Keith.....Brookline. 39 St. Paul St.
1913 Bouvier, Charles William.....Holyoke. 251 Maple St.
1912 Bowditch, Harold.....Boston.
520 Commonwealth Av.
- 1903 Bowditch, Henry Ingersoll. Brookline. Office, Boston.
86 Bay State Road.
- 1881 Bowditch, Vincent Yardley. Boston. 506 Beacon St.
1915 Bowen, Alfred Preston.....Lynn. 17 Fayette St.
1913 Bowen, Enos Emanuel.....East Boston.
290 Sumner St.
- 1912 Bowen, James Francis.....Amherst. 6 Maple Av.
1887 Bowen, John Templeton.....Boston. 14 Marlboro' St.
1867 Bowen, Seabury Warren Fall River. 217 Second St.
†1905
- 1912 Bowers, George Francis Worcester. 574 Main St.
Haskell
- 1879 Bowers, Walter Prentice.....Clinton. 264 Chestnut St.
1891 Bowker, Everett M.....Brookline. 322 Harvard St.

- 1894 Bowles, George Hall.....Plymouth, N. H.
2 Russell St.
- 1892 Bowman, Fred Raymond....Boston. 211 Huntington Av.
- 1914 Boyd, Francis Peter.....Springfield. 340 Bridge St.
- 1896 Boyd, James Van Wagner....Springfield. 24 Oxford St.
- 1885 Boyd, Samuel George.....San Francisco, Calif.
133 Geary St.
- 1911 Boyden, Arthur Henry....Worcester. 893 Main St.
- 1901 Boyer, Joseph Napoleon....Springfield. 577½ Main St.
- 1906 Boyle, Jeremiah Joseph....Cambridge.
1431 Cambridge St.
- 1903 Boyle, John Francis.....Lowell. 32 Whipple St.
- 1902 Brace, George Wells.....Westfield. 5 Woronoco Av.
- 1886 Brackett, Elliot Gray....Boston. 166 Newbury St.
- 1895 Bradford, Cary Carpenter....Southbridge. 67 Main St.
- 1873 Bradford, Edward.....Boston. 133 Newbury St.
- Hickling
- 1878 Bradford, Henry.....Wolfborough, N. H.
Withington
- 1883 Bradley, Charles Seymour..Roxbury (Boston).
71 Walnut Av.
- 1914 Brady, Cecil Norbert....Lowell. St. John's Hosp.
- 1906 Brady, Frank Robert....Lowell. 8 Merrimack St.
- 1903 Brady, James Francis....Boston. 599 Tremont St.
- 1908 Brady, Joseph Edward....Brookton. 231 Main St.
- 1912 Brady, William Francis....Holyoke. 348 Dwight St.
- 1871 Bragdon, George Albert....Middletown, Conn.
†1906
- 1890 Bragdon, Horace Elwood...East Boston (Boston).
7 Central Sq.
- 1894 Bragg, Frank Adelbert....Foxborough. School St.
- 1902 Bragg, Leslie Raymond....Webster. 124 Main St.
- 1884 Brainerd, John Bliss.....Brookline. Office, Boston.
419 Boylston St.
- 1907 Brainerd, Walter Scott....Bradford (Haverhill).
Office, Haverhill.
91 Merrimack St.
- 1909 Brant, Austin.....Boston. 483 Beacon St.
- 1915 Brassil, Timothy Francis....Cambridge. 297 Broadway.
- 1903 Bratton, Roland Walker....Dorchester (Boston).
693 Washington St.
- 1909 Brearton, Edward John....Dorchester (Boston).
1015 Dorchester Av.
- 1885 Breck, Samuel.....Roxbury (Boston).
Office, Boston.
238 Newbury St.
- 1901 Breed, Nathaniel Perkins..Douglaston, Long Island, N. Y.
- 1901 Breed, Nathaniel Pope....Lynn. 9 Washington Sq.
- 1910 Breen, James Henry....Hudson. 164 Main St.
- 1911 Bremer, John Lewis.....Boston. 295 Marlboro' St.
- 1887 Brennan, John Joseph....Worcester. 390 Main St.
- 1913 Breslin, John George....Boston.
514 Commonwealth Av.
- 1911 Bresnahan, John Francis...Roxbury (Boston).
Office, Boston.
69 Newbury St.
- 1914 Bresnihan, Frank Nesdel...Cambridge. 252 Harvard St.
- 1915 Brewster, David Trueman, Hathorne (Danvers).
Jr. State Hospital.
- 1893 Brewster, George.....Boston. 213 Beacon St.
- Washington Wales
- 1898 Brickett, Beatrice Hannah..Newton Highlands (New-
ton). 68 Floral St.
- 1907 Brickley, William Joseph...Charlestown (Boston).
Office, Boston. Relief
Station, Haymarket Sq.
- 1912 Brides, Arthur Edward....Brookton. 101 Main St.
- 1899 Bridgman, Burt Nicholas...Jamaica Plain (Boston).
4 Greenough Av.
- 1893 Briggs, Charles Albert....Freetown.
- 1880 Briggs, Edward Cornelius..Chestnut Hill (Newton).
Office, Boston.
129 Marlboro' St.
- 1883 Briggs, Frederick.....Boston.
Melancthon 536 Commonwealth Av.
- 1890 Briggs, Lloyd Vernon....Boston. 64 Beacon St.
- 1903 Brigham, Clarence Sumner..Leominster. 61 Pearl St.
- 1868 Brigham, Edwin Howard...Brookline. Office, Boston.
8 The Fenway
- 1912 Brigham, Francis Gorham..Boston. 355 Marlboro' St.
- 1907 Brigham, Fred Clayton....Springfield. 192 Walnut St.
- 1907 Bright, James Cooper.....Fall River.
710 South Main St.
- 1915 Brindamour, Joseph.....Holyoke. 81 High St.
Edmond
- 1906 Brindisi, Rocco.....Boston. 149 Richmond St.
- 1908 Broderick, Frank Patrick..Jamaica Plain (Boston).
67 South St.
- 1911 Broderick, Thomas.....Boston. 483 Beacon St.
Frederick
- 1884 Broidrick, James Patrick..Jamaica Plain (Boston).
†1914 815 Center St.
- 1906 Brooks, Edith May.....Roxbury (Boston).
53 Parker Hill Av.
- 1874 Brooks, Lawton Stickney..Springfield.
†1913 128 Chestnut St.
- 1890 Brooks, William Allen....Boston. 167 Beacon St.
- 1893 Brough, David Dandle....Boston. City Hall Annex.
- 1899 Broughton, Arthur Nicholson Jamaica Plain (Boston).
10 Roanoke Av.
- 1878 Broughton, Henry White...Jamaica Plain (Boston).
7 Lakeville Pl.
- 1896 Brousseau, William Gilbert..Cambridge. 2222 Mass. Av.
- 1911 Brown, Arthur Aloysius....Millbury. 19 Maple St.
- 1910 Brown, Arthur Linwood....Winchester. Office, Boston.
419 Boylston St.
- 1912 Brown, Chester Perkins...Cambridge. 89 Hancock St.
- 1894 Brown, Daniel Joseph....Springfield. 317 Main St.
- 1905 Brown, Edward Manning..Springfield. 182 State St.
- 1898 Brown, Edward Wells....Northampton. 39 Main St.
- 1861 Brown, Francis Henry.....Boston. Office, 15 State St.
†1910
- 1883 Brown, Frank Byron.....Dorchester (Boston).
529 Washington St.
- 1884 Brown, George Artemas...Barre. Broad St.
- 1904 Brown, George Christopher..Worcester. 1 Trumbull Sq.
- 1914 Brown, Herbert Rutherford..Jamaica Plain (Boston).
47 Hampstead Road.
- 1907 Brown, Lloyd Thornton...Boston. 372 Marlboro' St.
- 1869 Brown, Marshall Lebanon..Address unknown.
†1908
- 1893 Brown, Martin Millard....North Adams.
112½ Main St.
- 1901 Brown, Melvin James....Address unknown.
- 1873 Brown, Orland Jonas....North Adams. 112 Main St.
- 1902 Brown, Percy.....Boston. 155 Newbury St.
- 1914 Brown, Ralph Neally....Malden. 568 Main St.
- 1915 Brown, Roy Farrington...Fall River. 878 Rock St.
- 1906 Brown, Wallace Everett....North Adams. Berkshire
Hills Sanatorium.
- 1888 Brown, Wilfred Gardner...Plymouth. 4 North St.
- 1908 Brown, William James....Boston. 1109 Boylston St.
- 1909 Brown, William John....Reading. 18 Salem St.
- 1914 Browne, William Edward...Boston. 43 Bay State Road.
- 1881 Browne, William Tyler....Norwich, Conn.
275 Broadway.
- 1898 Brownrigg, Albert.....Nashua, N. H. Highland
Springs Sanitarium.
- 1888 Brownrigg, John.....Roxbury (Boston).
Sylvester 16 Delle Av.
- 1895 Bruce, Daniel Angus....Atlantic (Quincy).
- 1896 Bruce, John Angus.....Everett. 699 Broadway.
- 1913 Brunelle, Arthur Lord....New Bedford.
1495 Acushnet Av.
- 1898 Brunelle, Pierre.....Lowell.
10 East Merrimack St.
- 1893 Bryant, Alice Gertrude....Boston. 502 Beacon St.
- 1906 Bryant, Clarence Edmund..Hyde Park (Boston).
101 Highland St.
- 1901 Bryant, Frederick.....Worcester. 778 Main St.
- 1892 Bryant, Giles Waite.....West Somerville (Somer-
ville). 36 College Av.
- 1911 Bryant, John.....Boston. 338 Marlboro' St.
- 1902 Bryant, John Edmund....Haverhill.
50 Merrimack St.
- 1894 Bryant, Lewis Lincoln....Cambridge. 930 Mass. Av.
- 1907 Bryant, Mason David....Lowell. 8 Merrimack St.
- 1887 Bryant, William Scholer...New York, N. Y.
41 East 33d St.

- 1909 Bucholz, Carl Hermann....Cambridge. Office, Boston.
130 Beacon St.
- 1893 Buck, Augustus Walker....Fall River. 252 Pine St.
- 1914 Buck, Clifton Leon.....Danvers. 35 Hill St.
- 1882 Buck, Howard Mendenhall, Boston. 857 Beacon St.
- 1899 Buck, Maurice Allen.....Billerica.
- 1874 Buckingham, Edward Boston. 342 Marlboro' St.
- Marshall
- 1914 Buckley, Daniel Joseph....Arlington. 240 Broadway.
- 1913 Buckley, George Ambrose....Brookton. 28 Main St.
- 1886 Buckley, Philip Townsend, South Boston (Boston).
- 399A Broadway.
- 1906 Buckley, William Stephen, Brighton (Boston).
- 253 Market St.
- 1911 Budington, Harold Springfield. 1019 State St.
- Fairchild
- 1899 Buehler, George Cambridge. Office, Boston.
- Van Baskirk 1075 Boylston St.
- 1903 Bufford, John Henry.....Brookline. Office, Boston.
- 390 Commonwealth Ave.
- 1898 Buffum, Herbert Edwin....Somerville. 129 Perkins St.
- 1874 Bulfinch, George Greenleaf, Brookline. 526 Harvard St.
- 1902 Bulkeley, Frank Steadman, Ayer, Washington St.
- 1859 Bullard, John Thornton....New Bedford.
- 428 County St.
- 1880 Bullard, William Norton....Boston. 89 Marlboro' St.
- 1915 Bunker, Sidney Moore....Worcester. State Hospital.
- 1907 Burbeck, Edward Kimball, Salem. 245 Lafayette St.
- 1906 Burgess, Charles James....Lawrence. 37 Whitman St.
- 1905 Burke, Francis Ramon....Quincy. 1220 Hancock St.
- 1910 Burke, George Herbert....Springfield.
- 36 Beaumont St.
- 1892 Burke, James Joseph....Easthampton. 10 Center St.
- 1896 Burke, Michael Francis....Natick. 12 West Central St.
- 1901 Burke, Walter Thomas....Medford. 112 Salem St.
- 1909 Burke, William Henry, Jr., Cambridge. 2 Bond St.
- 1902 Burley, Benjamin Thomas, Worcester. 25 High St.
- 1909 Burlingham, Louis Herbert, Roxbury (Boston).
- Peter Bent Brigham Hosp.
- 1906 Burnett, Francis Lowell....Boston. 82 Beacon St.
- 1897 Burnett, Frank Hollis....Brookton. 153 Main St.
- 1894 Burnham, Elmond Arthur....Boston. 154 Huntington Av.
- 1901 Burnham, Joseph Forrest....Lawrence. 99 Bradford St.
- 1905 Burnham, Parker....Gloucester. 3 Pleasant St.
- 1899 Burns, Frederick Stanford, Boston. 237 Marlboro' St.
- 1892 Burns, Hiram Hutchins....Plymouth. 9 North St.
- 1912 Burns, Newell Bly.....North Reading.
- State Sanatorium.
- 1910 { Burns, Robert Francis....Fitchburg. 2 Lunenburg St.
- 1915 {
- 1915 Burns, Walter Linn....Lynn. 81 North Common St.
- 1886 Burrage, Walter Lincoln....Boston. 282 Newbury St.
- 1913 Burrell, Harry Cutter....Medford. 235 Salem St.
- 1907 Burrows, Marion Cowan....Lynn. 68 Ocean St.
- 1915 Burt, Clarence Edward....New Bedford. 180 Elm St.
- 1911 Burt, Edward Walter....Westport. Office, New Bedford. 321 Union St.
- 1885 Burt, Frank Leslie.....Boston. 528 Mass. Av.
- 1885 Burton, Stephen Casper....Pittsfield.
- 47 West Housatonic St.
- 1909 Bush, Arthur Dermont....Burlington, Vt.
- 14 Hungerford Terrace.
- 1874 Bush, John Standish Foster, Boston.
- +1915
- 1901 Bushnell, Edward Henry....Quincy. 566 Washington St.
- 1906 Bushold, Fred George....Lawrence. 60 Saunders St.
- 1899 Butler, Charles Shorey....Boston. 257 Newbury St.
- 1897 Butler, George Edward....Fall River.
- 674 South Main St.
- 1892 Butler, John Edward....Dorchester (Boston).
- 64 Monadnock St.
- 1905 Butler, Patrick Francis....Brookline. Office, Boston.
- 520 Beacon St.
- 1903 Butler, Richard Bernard....Fall River. 80 Columbia St.
- 1897 Butler, William Hodnett....Fall River. 234 Bedford St.
- 1904 Butterfield, George Reeds Ferry, N. H.
- Kittredge
- 1884 Buzzell, Daniel Thompson, Wilmington.
- 1892 Bychow, Victor....Malden. 226 Cross St.
- 1895 Byrne, Charles Armstrong, Hatfield. 46 Main St.
- 1912 Byrne, Claudius James....Worcester. 1056 Main St.
- 1904 Byrnes, Harry Francis....Springfield. 4 Chestnut St.
- 1898 Cabot, Hugh.....Boston. 87 Marlboro' St.
- 1892 Cabot, Richard Clarke....Boston. 1 Marlboro' St.
- 1911 Cady, Frederic Benjamin Cambridge.
- Mooers 79 Brattle St.
- 1886 Cahill, Charles Sumner....Cambridge. 311 Prospect St.
- 1910 Cahill, John William....Worcester. 390 Main St.
- 1894 Cain, William George....Nashua, N. H.
- 35 Concord St.
- 1915 Caines, Richard John Boston. 117 Mass. Av.
- Ridgeway
- 1903 Caisse, George Emile....Lowell. 724 Merrimack St.
- 1909 Caltril, Constant....Lawrence. 99 Jackson St.
- 1891 Calkins, Barry Howes....Stellarton. N. S.
- 1894 Calkins, Cheney Hosmer....Springfield. 383 Union St.
- 1903 Calkins, Irving Romaro....Springfield. 299 Central St.
- 1862 Calkins, Marshall +1893 Springfield. 14 Maple St.
- 1884 Call, Emma Louise....Boston. 9 Mass. Av.
- 1873 Call, Norman +1910 Brookline. 61 Sewall Av.
- 1908 Callahan, Henry Alphonsus, Jamaica Plain (Boston).
- 336 Center St.
- 1915 Callahan, John Francis....Brookton. 231 Main St.
- 1887 Callanan, Sampson Aloysius, Roxbury (Boston).
- 109 Warren St.
- 1911 Camfill, Robert Emmet....Springfield.
- 148 Chestnut St.
- 1858 Campbell, Benjamin.....East Boston (Boston).
- Franklin 24 White St.
- 1902 Canedy, Charles Francis....Greenfield. 17 1/2 Federal St.
- 1872 Canedy, Francis Joel +1913 Shelburne Falls (Shelburne). 60 Bridge St.
- 1909 Canfield, William Chase....Address unknown.
- 1912 Canney, Ellen Rose....New Bedford.
- 552 County St.
- 1904 Cannon, Walter Bradford, Cambridge. Office, Roxbury (Boston). 240 Longwood Av.
- 1913 Capeles, Thomas Francis....Haverhill. 120 Emerson St.
- 1898 Carden, Charles James....Haverhill.
- 276 Washington St.
- 1908 Carey, Bernard William....Fitchburg. 6 Prichard St.
- 1868 Carleton, Charles Greenleaf, Lawrence. 301 Essex St.
- 1896 Carleton, Dudley.....Springfield. 137 1/2 State St.
- 1898 Carleton, Ralph.....Springfield. 10 Temple St.
- 1906 Carley, Frederic James....North Attleborough.
- 1 Church St.
- 1909 Carley, Margaret Elizabeth Boston. 483 Beacon St.
- 1911 Carlisle, Frank Henry....Foxborough. State Hosp.
- 1908 Carlton, Frank Carr....Salem. 16 North St.
- 1906 Carney, Patrick Joseph....Worcester.
- 626 Southbridge St.
- 1915 Carpenter, Robert John....North Adams.
- 65 Church St.
- 1910 Carr, Arthur Wyman....Bridgewater. 76 South St.
- 1912 Carr, Christopher James....Saxonville (Frammingham).
- 26 Central St.
- 1909 Carr, Gladys Lydia....Lynn. 125 Ocean St.
- 1906 Carr, Percy Whitman....Hyde Park (Boston).
- 16 Neponset Blk.
- 1909 Carroll, Charles Curtis....Dorchester (Boston).
- 10 Esmond St.
- 1911 Carroll, Henry Gerald....Peabody. Office, Salem.
- 304 Essex St.
- 1905 Carroll, John Joseph....Holyoke. 120 Chestnut St.
- 1899 Carroll, John Philip....Woburn. 16 Winn St.
- 1914 Carroll, Michael James....Lenox. Main St.
- 1888 Carroll, Thomas Francis....Lowell. 219 Central St.
- 1897 Carruth, Sidney Stetson....Dorchester (Boston).
- 713 Dudley St.
- 1913 Carvell, Hanford.....Gloucester.
- 1050 Washington St.
- 1914 Carvill, Alphonso Holland, Somerville.
- 28 Highland Av.
- 1905 Carvill, Lizzie Maud....Somerville. Office, Boston.
- 101 Newbury St.
- 1902 Cary, Foster Harrington....Worcester. 47 West St.
- 1912 Casey, John Francis....Allston (Boston).
- 94 Franklin St.
- 1908 Casselberry, Clarence Brookline. Office, Boston.
- Marmaduke 1075 Boylston St.
- 1912 Cassels, Louis Raymond....Worcester. 60 Franklin St.

- 1908 Cassidy, James Joseph....Lowell.
10 East Merrimack St.
- 1913 Castleman, Philip.....Boston. 43 Chambers St.
- 1914 Caswell, Bertram Horace...Somerville. 196 Broadway.
- 1910 Caswell, Walter Emery....Campello (Brockton).
1147 Main St.
- 1903 Caulfield, Thomas Edward Woburn. 14 Church Av.
- 1897 Cavanagh, Charles Dorchester (Boston).
- Russell 19 Richmond St.
- 1905 Cavanaugh, Thomas Holyoke. 245 Maple St.
- Edward
- 1905 Celce, Frank Frederick....Holyoke. 264 Maple St.
- 1905 Celce, Jean Henriette....Holyoke. 264 Maple St.
- 1909 } Ceconi, John Aloysius { Dorchester (Boston).
- 1915 } 14 Arcadia St.
- 1913 Chace, Fenner Albert.....Fall River.
- 373 North Main St.
- 1888 Chadbourne, Arthur Boston. 193 Beacon St.
- Patterson
- 1895 Chadwick, Henry Dexter...Westfield.
- State Sanatorium.
- 1906 Chalmers, Hattie Elizabeth..Marlborough.
- 32 West Main St.
- 1908 Chalmers, Robert.....Woburn. 49 Pleasant St.
- 1872 Chamberlain, Myron Levi..Beverly. Office, Boston.
- 482 Commonwealth Av.
- 1895 Chamberlain, William Rutland.
- Eugene
- 1914 Chamberlin, Harold Hartford, Conn.
- Augustus Isolation Hospital.
- 1907 Champion, Merrill Edwin..Wollaston (Quincy).
- 50 Phillips St.
- 1905 Chandler, Clarence Luther..Fitchburg. 15 Adams St.
- 1915 Chandler, Harold Beckles..West Newton (Newton).
- 51 Winthrop St.
- 1883 Chandler, Henry Beckles..West Newton (Newton).
- Office, Boston.
- 34½ Beacon St.
- 1888 Chandler, Norman Fitch...Medford. 82 High St.
- 1911 Chandler, Thomas Evans...Boston. 19 Bay State Rd.
- 1873 } Channing, Walter..... { Brookline. Boylston St.
- 1878 } and Chestnut Hill Av.
- 1898 Chapin, Clifford Samuel...Great Barrington.
- 321 Main St.
- 1891 Chapin, Della Lucretia....Springfield. 313 State St.
- 1906 Chapin, Laurence Dudley..Springfield. 20 Maple St.
- 1885 Chapin, Walter Henry....Springfield. 675 State St.
- 1915 Chapin, William Andrew Springfield.
- Robertson Springfield Hospital.
- 1899 Chapman, Charles Springfield. 174 State St.
- Ratchford
- 1913 Charbonneau, Noe Grafton. Fisherville P. O.
- Napoleon
- 1886 Charles, Orlando Bryantville (Pembroke).
- Warrington
- 1900 Charteris, Mary Alena....Worcester. 167 Pleasant St.
- 1908 Chase, Charles Otis.....Watertown.
- 51 Mt. Auburn St.
- 1900 Chase, Edwin Llewellyn...Shrewsbury.
- 1908 Chase Gilman Leeds....Clinton. 215 High St.
- 1907 Chase, Harrison Ayer....Brookton. 231 Main St.
- 1909 Chase, Heman Baker.....Hyannis (Barnstable).
- Main St.
- 1886 Chase, Heman Lincoln....Brookline. 126 Harvard St.
- 1902 Chase, Henry Melville....Boston. 409 Marlboro' St.
- 1855 Chase, Ira Eaton †1897 Haverhill. 59 Park St.
- 1915 Chase, Joseph, Jr.....Weymouth. 655 Broad St.
- 1902 Chase, Walter Greenough...Boston. 279 Marlboro' St.
- 1914 Cheever, Austin Walter...Mattapan (Boston).
- 1531 Blue Hill Av.
- 1886 Cheever, Clarence Alonzo..Mattapan (Boston).
- 1531 Blue Hill Av.
- 1902 Cheever, David †1907 Boston. 355 Marlboro' St.
- 1891 Cheney, William Ellisha...Boston. 222 Huntington Av.
- 1886 Cheney, Frederick Concord. Office, Boston.
- Edward 64 Commonwealth Av.
- 1905 Chesley, Alfred Ervan....Lawrence. 181 Essex St.
- 1895 Chicolne, Isidore Lynn. 206 Lewis St.
- Hermanlgilde
- 1876 Chipman, William Chelsea. 44 County Road.
- Reginald †1915
- 1906 Chisholm, Miles Dudley....Westfield. 128 Elm St.
- 1854 Choate, David †1899 Salem. 35 Norman St.
- 1900 Choate, Horace Henry....Gloucester. 80 Middle St.
- 1903 Cholerton, Herbert.....West Somerville (Somerville). 94 College Av.
- 1902 Christian, Henry Asbury...Boston. 252 Marlboro' St.
- 1908 Christiernin, Charles East Orange, N. J. Office.
- Leonard New York, N. Y.
- 1 Madison Av.
- 1915 Chronquest, Alfred Peter..Hathorne (Danvers).
State Hospital.
- 1895 Church, Charles Albert...Millbury. Elm St.
- 1912 Church, Claude Henry....Address unknown.
- 1906 Churchill, John Larling...Plymouth. 63 Court St.
- 1895 Chute, Arthur Lambert....Boston. 350 Marlboro' St.
- 1888 Cilley, Daniel Plummer...Westborough.
- 30 East Main St.
- 1913 Claffy, John McMahon....Springfield. 172 Main St.
- 1891 Clancy, William Henry....East Cambridge (Cambridge). 80 Otis St.
- 1900 Clap, Edmund Wright.....Boston.
- 390 Commonwealth Av.
- 1903 Clapp, Arthur Martin....Springfield. 10 Chestnut St.
- 1892 Clapp, Frank Horace....North Grafton (Grafton).
- 1898 Clark, Albert Ulysses Westborough.
- Franklin 10 Parkman St.
- 1869 Clark, David †1908 Springfield. 155 Long Hill.
- 1901 Clark, Edward James....Lowell. 219 Central St.
- 1901 Clark, Ezra Warren †1914 Brockton. 3 Garden Road.
- 1913 Clark, Frank Robinson....Newtonville (Newton).
- 227 Walnut St.
- 1901 Clark, Frederick Timothy...Westfield. 80 Elm St.
- 1893 Clark, George Henry....Holyoke. 441 High St.
- 1905 Clark, George Oliver....Boston. 142 Beacon St.
- 1911 Clark, Harry Ainsworth...Port Limon, Costa Rica.
- The Hospital.
- 1897 Clark, James Colby Dorr...Medford. 4 Washington St.
- 1906 } Clark, John Donovan....Andover. 111 Main St.
- 1913 }
- 1886 Clark, Joseph Payson....Boston. 71 Marlboro' St.
- 1880 Clark, Julius Stimpson Medrose. 109 Myrtle St.
- †1911
- 1889 Clark, Leonard Brown....Waverley (Belmont).
- 36 Sycamore St.
- 1897 Clark, Mary Wilson....Medford. 4 Washington St.
- 1892 Clark, Sidney Avery....Northampton. 124 Main St.
- 1903 Clark, Thomas Francis...Taunton. 62 Broadway.
- 1910 Clark, Webster Kimball...Greenfield. 6 Franklin St.
- 1907 Clark, William Irving, Jr..Worcester. 37 Pearl St.
- 1914 Clark-MacLeod, Emily....Boston. 260 Newbury St.
- 1901 Clarke, Genevieve.....Cambridge. 825 Mass. Av.
- 1911 Clarke, Harry Carver....Lynn.
- 180 South Common St.
- 1904 Clarke, Inez Louise.....Cambridge. 825 Mass. Av.
- 1888 Clarke, Israel James....Haverhill. 112 Emerson St.
- 1910 Clarke, Joshua Williams...Attleborough. 48 Bank St.
- 1902 Clarke, Louis Henry....Holyoke. 282 Maple St.
- 1915 Clarke, Mary Ella.....Malden. 53 Washington St.
- 1915 Clarke, Willis Earl.....Malden. 490 Pleasant St.
- 1897 Cleary, James.....Cambridge. 770 Mass. Av.
- 1914 Cleary, Robert Emmett....Holyoke. 1049 Dwight St.
- 1901 Cleaves, Ezra Eames....Rockport. 27 Main St.
- 1895 Cleaves, Frederick Henry..Brookline. Office, Boston.
- Custom House.
- 1908 Cleaves, Helen Frances Palmer.
- Taft Monson State Hospital
- 1874 Clement, George Wilmot...Roxbury (Boston).
- 275 Warren St.
- 1902 Clement, Merton Wallace..Worcester. 811 Main St.
- 1911 Cleveland, Heber Howe...Wellesley Hills. Office.
- Boston. 205 Beacon St.
- 1875 Cliff, Leander Albert....Boston. 427 Shawmut Av.
- 1901 Cloudman, Harry Brockton. 33 Clinton Av.
- Radcliffe
- 1911 Clymer, George.....Boston. 126 Bay State Rd.
- 1914 Coates, Edward Augustus..Winthrop. 6 Herman St.
- 1892 Cobb, Albert Crocker....Marion. Front St.
- 1895 Cobb, Carolus Melville....Lynn. Office, Boston.
- 419 Boylston St.

- 1907 Cobb, Chester Thompson...Northampton. 91 South St.
 1893 Cobb, Farrar.....Boston.
 28 Commonwealth Av.
 1889 Cobb, Frederic Codman....Boston. 11 Marlboro' St.
 1912 Cobb, Gardner Nathan....Boston. North End Park.
 U. S. S. "Ranger".
 1897 Cobb, Oliver Warren.....Easthampton. 59 Main St.
 1914 Coburn, Harry Ray.....Tewksbury.
 State Infirmary.
 1904 Coburn, Horace Fordyce...Lowell. 9 Central St.
 1898 Cochran, William James...Natick. 50 West Central St.
 1914 Cochrane, Robert Carlyle...Boston. 96 Bay State Rd.
 1905 Cockett, Marguerite.....Bryn Mawr, Pa.
 Standish Pembroke and Guelph Rds.
 1895 Codman, Ernest Amory....Boston. 227 Beacon St.
 1912 Cody, Edmond Francis....New Bedford.
 105 South 6th St.
 1912 Cody, Harry Clinton.....Lawrence. 539 Broadway.
 1885 Coffin, Arthur Baylies....Dorchester (Boston). Office
 Boston. 159 Devonshire St.
 1907 Coffin, Frank Herbert....Haverhill. 91 Emerson St.
 1896 Coffin, Rockwell Augustus..Boston. 234 Clarendon St.
 1887 Cogan, Joseph Ambrose....Boston. 419 Boylston St.
 1892 Cogswell, George Proctor...Cambridge. 13 Garden St.
 1896 Cogswell, William.....Haverhill.
 151 Merrimack St.
 1910 Colberg, Peter Albert.....Worcester. 17 Stebbins St.
 1897 Colburn, Harry Hayford...Boston. 103 Mt. Vernon St.
 1912 Cole, Arthur Judson.....Holbrook.
 North Franklin St.
 1892 Collier, Lawrence Henry Jamaica Plain (Boston).
 Goodwin 212 South St.
 1915 Collins, Frank Laforest....Salem. 31 Charter St.
 1910 Collins, Joseph Daniel....Northampton. 90 Main St.
 1903 Collins, Richard.....Waltham. 837 Main St.
 1899 Collins, William James....Northampton. 90 Main St.
 1908 Collins, William Morris...Lowell. 22 Central St.
 1881 Colt, Henry.....Pittsfield. 193 South St.
 1907 Comey, Perley Pierce....Augusta, Ga.
 Walton Way and Telfair St.
 1883 Conant, William Merritt...Boston.
 486 Commonwealth Av.
 1913 Condrick, John Joseph....Brocton. 68 Main St.
 1883 } Cone, Dwight Eleazer. { Fall River.
 1900 } 938 South Main St.
 1913 Conley, Brainard Francis..Malden. 203 Main St.
 1909 Conlin, Robert Emmett....Woburn. 353 Main St.
 1906 Conlon, Frank Aloysius...Lawrence. 301 Essex St.
 1901 Connell, Arthur Irving....Fall River.
 456 South Main St.
 1909 Connelly, John Edward....Brookline. 156 Cypress St.
 1902 Conner, Homer Leigh.....Haverhill. 85 Emerson St.
 1897 Connor, Charles Frank...New Bedford.
 11 North Orchard St.
 1910 Connor, George James....Haverhill. 50 Merrimack St.
 1902 Conro, Arthur Clifton....Attleborough.
 15 Mechanic St.
 1906 Conroy, Edward Cornelius..Andover. Office.
 Lawrence. 263 Essex St.
 1895 Conroy, Peter John.....Everett. 355 Broadway.
 1915 Constans, John Elmore....Brocton. 7 Main St.
 1879 Cook, Charles Henry.....Natick. 35 West Central St.
 1914 Cook, James Henry.....Braintree.
 346 Washington St.
 1914 Cook, John William.....Mansfield.
 114 North Main St.
 1905 Cook, Philip Howard.....Worcester. 771 Main St.
 1893 Cook, Snow Parker.....Gloucester. 132 Main St.
 Freeman
 1895 Cooke, George Andrews...Montague.
 1905 Cooley, Abbott Lathrop...Chicopee Falls (Chicopee).
 130 Broadway.
 1885 Coolidge, Algernon.....Brookline. Office, Boston.
 613 Beacon St.
 1893 Coolidge, John Nelson....New York, N. Y.
 1 Madison Av.
 1901 Coolidge, Sumner.....Middleborough. Lakeville
 State Sanatorium.
 1898 } Coon, George Bailey.....East Walpole (Walpole).
 1903 }
 1907 } Coon, William Hall.....Haverhill.
 1915 } 112 West Emerson St.
 1912 Cooney, Margaret Blanche..Haverhill. 67 Winter St.
 1909 Cooney, Michael Edward...Northampton. 39 Main St.
 1892 Cooper, Almon.....Brookline. 67 Marion St.
 1915 Copeland, Elmer Humphrey Northampton. 168 Elm St.
 1878 Copeland, Horatio Franklin Whitman.
 1913 532 Washington St.
 1914 Coppinger, Sarah Elizabeth..Needham. 299 Highland Av.
 1906 Corbett, Jeremiah Joseph..Malden. Office, Boston.
 520 Beacon St.
 1911 Corcoran, George Bartlett..West Springfield.
 30 Park St.
 1909 Corcoran, John Gilbert....Hamilton.
 1905 Corey, Frederick Hall....Rockland. 361 Union St.
 1907 Coriat, Isador Henry.....Boston. 416 Marlboro' St.
 1911 Cornforth, Herbert.....Fitchburg.
 Huskisson 17 Westminster St.
 1913 Cornish, Solon Washington..Everett. 64 Corey St.
 1907 Cornwall, Andrew Payne...Brookline. Office, Boston.
 535 Beacon St.
 1904 Cort, Parker Martin.....Springfield. 691 State St.
 1915 Cosby, Edwin Gordon....South Boston (Boston).
 Carney Hospital.
 1908 } Costello, John Henry... { Dorchester (Boston).
 1913 } 68 Pleasant St.
 1905 Coté, Honoré Joseph.....Boston. 23 Warren Av.
 1912 Cotter, Timothy Francis...Haverhill.
 298 Washington St.
 1897 Cotton, Frederic Jay.....Boston.
 520 Commonwealth Av.
 1913 Couch-Mora, Mary.....Fajardo, Porto Rico.
 Catharine Box 162.
 1895 Coues, William Pearce....Boston. 31 Mass. Av.
 1895 Couillard, Pierre Leonard..Manchester (Sutton).
 1892 Councilman, William.....Boston.
 Thomas Office, Roxbury (Boston).
 240 Longwood Av.
 1911 Coupal, James Francis....Roxbury (Boston).
 Office, Boston.
 1091 Boylston St.
 1915 Courie, Wadie Fadoul.....Boston. 79 Tyler St.
 1914 Coursey, Frank Rudolph...Boston. 802 Tremont St.
 1893 Courtney, Joseph William..Boston. 436 Marlboro' St.
 1914 Courtney, Thomas Joseph..Waltham. 26 Common St.
 1892 Cousins, Nicholas William..Waltham. 17 Crescent St.
 1872 Cowles, Edward 1910 Plymouth. 8 Sever St.
 1886 Cowles, Frank Augustus...Beverly. 276 Cabot St.
 1901 Cowles, Frederick.....West Brookfield.
 Waterman
 1910 Cowles, William Lee.....Boston. 497 Beacon St.
 1887 Cowles, William Norman...Cataumet (Bourne).
 1907 Cox, Ann Caroline.....Boston. 70 Huntington Av.
 1914 Cox, Oscar Francis.....Boston. 338 Mass. Av.
 1905 Cox, Simon Francis.....New Haven, Conn.
 New Haven Hospital.
 1913 Cox, Stanley Cullen.....Holyoke. 242 Maple St.
 1901 Coyne, Thomas Joseph....Roxbury (Boston).
 636 Dudley St.
 1914 Crabtree, Ernest Granville..Brookline. Office, Boston.
 87 Marlboro' St.
 1905 Craig, William Gibson....Springfield. 317 Main St.
 1889 Craigin, George Arthur...Boston. 18 Hereford St.
 1891 Cram, John Wesley.....Colrain.
 1915 Crandall, Walter Midkiff..Lawrence. 43 Broadway.
 1896 Crandell, Arthur Richmond..Taunton. 48 Church Green.
 1899 Crandon, Le Roi Goddard..Boston.
 366 Commonwealth Av.
 1906 Crane, Bayard Taylor....Rutland. Maple Av.
 1909 Crane, Clarence.....Boston. 224 Huntington Av.
 1899 } Crawford, Francis Xavier. { Boston.
 1907 } Deer Island Hospital.
 1910 Crawford, Frank Wallis...Holbrook.
 North Franklin St.
 1885 Crawford, Sarah Marcy Newton Center (Newton).
 1911 194 Ward St.
 1914 Creamer, William Henry...Fall River, 466 N. Main St.
 1908 Creely, Oscar Slade.....Watertown.
 63 Mt. Auburn St.
 1906 Cregg, Francis Aloysius...Lawrence. 477 Essex St.

- 1909 Crittenden, George Alanson. Huntington.
 1900 Crittenden, Samuel Wright. Dorchester (Boston).
 State Hospital.
 1907 Crispo, Peter Timothy. Fall River. 439 Bedford St.
 1894 Croacher, Anna Wood. New Bedford. 51 Fifth St.
 1892 Crocker, Benton Pulsifer. Foxborough. South St.
 1866 Crocker, John Myrick. Cambridge.
 335 Harvard St.
 1904 Crocker, Louis Allen. Brewster.
 1887 Crocker, Susan Elizabeth. Los Angeles, Calif.
 †1901 849 W. 34th St.
 1891 Crockett, Eugene Anthony. Boston. 298 Marlboro' St.
 1898 Croft, Benjamin Pomeroy. Barnardston.
 Office, Greenfield.
 1913 Croke, Louis Ward. Dorchester (Boston).
 17 Federal St.
 1914 Cronin, Herbert Joseph. Cambridge. 69 Concord Av.
 1896 Cronin, Henry William. Worcester. 31 Trumbull St.
 1899 Cronin, Michael John. Roxbury. Office, Boston.
 520 Beacon St.
 1898 Cronin, Thomas Joseph. Worcester. 49 Pleasant St.
 1909 Crosbie, Arthur Hallam. Boston. 260 Clarendon St.
 1915 Crosby, Edwin Gordon. South Boston (Boston).
 Carnoy Hospital.
 1903 Crosby, Leander Marshall. Wakefield. Office, Boston.
 419 Boylston St.
 1910 Crosby, Walter Hiram. Brighton (Boston).
 305 Faneuil St.
 1912 Cross, Albert Elmer. Worcester. 390 Main St.
 1899 Cross, William Patrick. South Boston (Boston).
 491 Broadway.
 1897 Crossman, Frank Albert. Dorchester (Boston).
 677 Dudley St.
 1881 Croston, John Francis. Haverhill. 83 Emerson St.
 1886 Crowell, Samuel. Dorchester (Boston).
 8 Monadnock St.
 1897 Crowley, Jeremiah Francis. Adams. 15 Park St.
 1911 Cuddy, James Francis. Athol. 555 Main St.
 1915 Cudworth, Clarence Duane Miller's Falls (Montague).
 1887 Culbertson, Emma Valeria Boston. 33 Newbury St.
 Pintard Bicknell
 1889 Cummin, John White. Boston. 9 Mass. Av.
 1901 Cummings, Alvah Cochran. Newton.
 337 Washington St.
 1911 Cummings, Dana Frank. Cherryfield, Me.
 1876 Cummings, Edwin Francis. Revere. Office, Boston.
 43 State House.
 1904 Cummings, John Joseph. Worcester. 53 Pleasant St.
 1901 Cummings, Morton Everett. Malden. 358 Pleasant St.
 1888 Cummings, Mott Alvah. Winchester. 69 Church St.
 1905 Cummings, Loretta Joy. Boston.
 536 Commonwealth Av.
 1913 Cunningham, Allen Rowe. Boston. City Hospital.
 1903 Cunningham, John. Boston. 46 Gloucester St.
 Henry, Jr.
 1914 Cunningham, Joseph. Cambridge. 959 Mass. Av.
 Henry
 1877 Cunningham, Thomas. Cambridge. 847 Mass. Av.
 Edward
 1914 Cunningham, Thomas. Cambridge. 1010 Mass. Av.
 Edward, Jr.
 1905 Curley, Clarence Proctor. Provincetown.
 Commercial St.
 1914 Curran, John Francis. Worcester.
 507 Pleasant St.
 1905 Curran, Simon Francis. Dorchester (Boston).
 104 Norfolk St.
 1873 } Currie, John Zebulon. Cambridge. 907 Mass. Av.
 1893 }
 1912 Currier, Cyrus Richardson. Sandwich. Main St.
 1900 Currier, William Eugene. Leominster. 87 Merriam Av.
 1890 Currier, William Hale. Pittsfield. 69 Linden St.
 1898 Curry, Edmund Farnham. Fall River. 499 Hanover St.
 1908 Curry, Ernest Francis. Sagamore (Bourne).
 Keith Block.
 1915 Curtin, John Francis. North Abington
 (Abington). 6 Plymouth St.
 1909 Curtis, Charles Leverett. Salem. 78 Federal St.
 1887 Curtis, Francis George. Chestnut Hill (Newton).
 399 Hammond St.
 1910 Curtis, Harlan Fuller. East Longmeadow (Long-
 meadow). South Main St.
 1890 Curtis, Henry Fuller. Somerville. 145 Perkins St.
 1899 Curtis, William Goodwin. Wollaston (Quincy).
 10 Grand View Av.
 1906 Cushing, Arthur Alden. Brookline. 108 Marion St.
 1875 Cushing, Ernest Watson. Roxbury (Boston). Office,
 Boston. 168 Newbury St.
 1913 Cushing, Harvey. Brookline. Office, Roxbury
 (Boston). Peter Bent
 Brigham Hospital.
 1881 Cushing, Hayward Warren. Boston.
 70 Commonwealth Av.
 1887 Cushman, Andrew Bernard. South Dartmouth
 (Dartmouth).
 1882 Cushman, George Thomas. Roxbury (Boston).
 46 Dudley St.
 1911 Cushman, Howard Lewis. Methuen. 28 Annis St.
 1906 Cusick, Lawrence Francis. Nahant. Office Boston.
 99 Newbury St.
 1898 Cusick, Thomas Francis. Taunton. 126 Weir St.
 1898 Cutler, Charles Norton. Chelsea.
 309 Washington Av.
 1872 Cutler, Elbridge Gerry. Boston. 214 Beacon St.
 1912 Cutler, George David. Boston.
 384 Commonwealth Av.
 1914 Cutler, Myron Fred. Southbridge.
 39 Hamilton St.
 1915 Cutler, Raymond William. Worcester. 62 Coburn Av.
 1902 Cutter, Arthur Hardy. Methuen. Office Lawrence.
 333 Broadway.
 1856 Cutter, Ephraim. 1898 West Falmouth
 (Falmouth).
 1908 Cutter, Irving Taylor. Winchester. 31 Church St.
 1887 Cutts, Harry Madison. Brookline.
 105 Aspinwall Av.
 1906 Cyr, Emile Edouard. Lawrence. 81 Bradford St.
- D**
- 1905 Dacey, Cornelius Joseph. Brockton. 12 Cottage St.
 1902 Dadmun, Eliza Josephine. Allston (Boston).
 1376 Commonwealth Av.
 1904 Dailey, Edward Joseph. Somerville. 46 Bow St.
 1913 Dalton, Charles Howard. Brookline. 405 Harvard St.
 1908 Dalton, George Frederick. Springfield. 6 Maple St.
 1882 Daly, Bernard Thomas. Roxbury (Boston).
 320 Dudley St.
 1905 Daly, Jeremiah James. North Andover.
 8 North Main St.
 1898 Daly, Timothy Joseph. Lawrence. 62 Bradford St.
 1896 Daly, William Joseph. Boston. 31 Mass. Av.
 1902 Dame, Fred Russell. South Braintree (Brain-
 tree). 1010 Washington St.
 1895 Damon, Arthur Llewellyn. North Wilbraham
 (Wilbraham). Chapel St.
 1906 Dana, Harold Ward. Brookline. Office, Boston.
 483 Beacon St.
 1891 Dane, John. Jamaica Plain. Office,
 Boston. 29 Marlboro' St.
 1906 Danforth, Harland Abbott. Cliftondale (Saugus).
 276 Lincoln Av.
 1878 Daniels, Edwin Alfred. Boston. 302 Newbury St.
 1908 Darling, Arthur Edwin. Lynn. 65 Broad St.
 1895 Darling, Charles Balfour. Roxbury (Boston). Office,
 Boston. 419 Boylston St.
 1894 Darling, Eugene Abraham. Cambridge. 138 Brattle St.
 1890 Darrah, Rufus Elmer. Newport, R. I. 10 Bull St.
 1907 Dascombe, Otho Lee. Waltham. 259 Moody St.
 1900 Daudelin, Simeon. Worcester. 11 Elm St.
 Alphonse
 1871 Davenport, Bennett. Watertown. Office, Boston.
 Franklin. †1910 34 School St.
 1877 Davenport, Francis Henry. Boston.
 390 Commonwealth Av.
 1887 Davenport, James Henry. Providence, R. I.
 210 Benefit St.
 1906 Davidson, Henry James. Springfield. 26 Maple St.
 Duff

- 1891 Davidson, Kallman Meyer...Roxbury (Boston). Office,
Boston. 31 McLean St.
- 1895 Davis, Bessie Delano...Cambridge. 21 Magazine St.
- 1911 Davis, Charles Allen...South Dennis (Dennis).
- 1899 Davis, Charles Henry...South Hamilton
(Hamilton).
- 1888 Davis, Ella Maxfield...Holyoke. 188 Chestnut St.
- 1906 Davis, Ernest Leland...Springfield. 106 State St.
- 1907 Davis, Frank Albert...Boston. Hotel Brunswick.
- 1913 Davis, Frederick Durand...Westfield. 57 North Elm St.
- 1915 Davis, George Rufus...Marshfield Hills
(Marshfield). Main St.
- 1914 Davis, Henry Levi...Lynn. 12 Van Buren Terr.
- 1899 Davis, Lincoln...Boston. 205 Beacon St.
- 1906 Davis, Minot Flagg...Boston. 15 Charles St.
- 1899 Davis, Percy Guy...Deerfield.
- 1880 Davis, Samuel Thomas...Vineyard Haven (Tisbury).
- 1807 Davis, Stephen Rich...Lynn. 188 Chestnut St.
- 1898 } Davis, William Horace...Dorchester (Boston).
- 1913 } 23 Beaumont St.
- 1905 Davison, Arthur Howard...Dorchester (Boston).
- 1914 Dawson, Roger Paul...Boston. 205 Beacon St.
- 1911 Day, Charles Orrin...Hingham. Main St.
- 1892 Day, Clarence Currier...Newburyport.
- 1905 Day, Hilbert Francis...Boston. 657 Boylston St.
- 1914 Deacy, John Joseph...Lawrence. 301 Essex St.
- 1893 Deal, Edward Edwin...Brookline.
- 147 Winthrop Road.
- 1892 Deal, George Francis...Malden. 807 Salem St.
- 1896 Dean, Ralph Denniston...Taunton. 152 High St.
- 1886 Deane, Asahel Sumner...Taunton. 60 Broadway.
- †1902
- 1887 Deane, Wallace Harlow...Springfield. 137½ State St.
- 1907 Dearborn, George Van Ness...Cambridge. Office, Boston.
- 416 Huntington Av.
- 1908 Dearborn, Henry Follansby...Lawrence. 193 Garden St.
- 1906 Dearborn, Henry Hale...Becket.
- 1872 Dearborn, John George...Charlestown (Boston).
- †1907
- 2 Wood St.
- 1893 Dearing, Henry Lincoln...Braintree.
- 1881 DeBlois, Thomas Amory...Boston. 523 Newbury St.
- 1914 Deering, Charles Fuller...Danvers. 57 Elm St.
- 1905 Deering, George Edwin...Worcester. 131 Pleasant St.
- 1915 Degoll, Frederick Burr...Lynn. 293 Euclid Av.
- 1890 Dehn, Edward William...New Bedford. 23 Linden St.
- 1886 DeLand, Charles Airmet...Warren. 7 Quaboag St.
- 1898 De Langie, Charles Petit...Lynn. 540 Western Av.
- 1884 Delahanty, William Joseph...Worcester. 5 Trumbull Sq.
- 1885 } Delano, Samuel...Boston. 39 Newbury St.
- 1912 }
- 1893 De Lue, Frederick...Needham. Office, Boston.
- Spaulding 99 Newbury St.
- 1911 Dempsey, James Edward...Newton.
- 395 Washington St.
- 1895 Denig, Blanche Alpine...Boston. 541 Boylston St.
- 1911 Dennen, Ralph Waite...Waltham. 258 Moody St.
- 1900 Dennett, Alonzo Gustin...Lowell. 40 Riverside St.
- 1897 Dennett, Charles Augustus...Arlington. 754 Mass. Av.
- 1898 Dennett, Daniel Clement...Winchester.
- 7 Washington St.
- 1906 Denning, Edward John...South Boston (Boston).
- 577 Broadway.
- 1909 Denning, Frédéric Joseph...South Boston (Boston).
- 216 Broadway.
- 1901 Denning, William Edward...Worcester. 63 Pleasant St.
- 1896 Dennison, Archibald Sayre...Lynn. 7 Franklin St.
- 1895 Denny, Francis Parkman...Brookline. 111 High St.
- 1915 Denny, George Parkman...Boston. 285 Marlboro' St.
- 1904 DeNormandie, Robert...Boston. 355 Marlboro' St.
- Laurent
- 1903 Derby, George Strong...Boston. 7 Hereford St.
- 1892 Derby, William Parsons...Cambridge. 120 Pearl St.
- 1914 Dervin Laurence James...Somerville.
- 218 Highland Av.
- 1911 Desmond, Clarence Francis...Waltham. 552 Main St.
- 1909 Devenny, Joseph Henry...Dorchester (Boston).
- 39 Florida St.
- 1904 Devere, Fred Hewitt...Sterling. Wausachum Av.
- 1884 Devine, William Henry...South Boston (Boston).
- 595 Broadway.
- 1903 Devlin, Peter Clarke...Lynn. 784 Western Av.
- 1886 Dewey, Charles Gipson...Dorchester (Boston).
- 44 Alban St.
- 1906 Dewing, Louis Alexander...Boston. 215 Huntington Av.
- 1893 Dewis, John William...Brookline. Office, Boston.
- 69 Newbury St.
- 1913 DeWolf, Charles...Tewksbury.
- Wentworth State Infirmary.
- 1887 Dexter, Franklin...Beverly. Office, Boston.
- 247 Marlboro' St.
- 1905 Dexter, Fred Fay...Springfield. 2 Temple St.
- 1907 Dickinson, Gyrdie Willie...Everett. Office, Boston.
- 673 Boylston St.
- 1898 Dickson, Richard Ensign...Holyoke. 598 Dwight St.
- 1910 Dillon, Michael John...Springfield. 182 State St.
- 1894 Dion, Thomas Joseph...West Quincy (Quincy).
- 59 Cross St.
- 1912 Disbrow, Edward Perry...Worcester. City Hospital.
- 1901 Dix, George Alfred...Worcester. 105 Pleasant St.
- 1911 Dixon, Arthur...Worcester. 313 Lincoln St.
- 1871 Dixon, Lewis Seaver...Boston. 232 Clarendon St.
- 1881 Dixon, Robert Brewer...Boston. 232 Clarendon St.
- 1911 Dobson, William Marshall...Dorchester (Boston).
- State Hospital.
- 1896 Dodd, Isaac Spencer Finney Pittsfield. 24 North St.
- 1912 Dodd, John Edward...Holliston. Office, Framing-
- ham. 33 Union Av.
- 1914 Dodd, Walter James...Boston. 205 Beacon St.
- 1900 Dodge, Arthur Malcolm...Boston. 483 Beacon St.
- 1907 Dodge, George Francis...Athol. 1302 Main St.
- 1886 Dodge, William Woodredge...Boston. 228 Mass. Av.
- 1882 Doggett, Frederic Fobes...South Boston (Boston).
- 805 Broadway.
- 1885 Dolan, William Andrew...Fall River.
- 546 South Main St.
- 1915 Dolan, William Edward...Worcester. 32 Lincoln St.
- 1915 Dolan, William Francis...Somerville. 31 Forest St.
- 1899 Dole, Charles Frederick...Sharon. 2 North Main St.
- 1889 Donahue, Hugh...Haverhill. 21 White St.
- 1895 Donahue, William Francis...Cambridge. 2294 Mass. Av.
- 1903 Donaldson, James Frank...Salem. 32 Lynde St.
- 1901 Donlan, Charles Edwin...Boston. Long Isld. Hosp.
- 1908 Donnell, Herbert Anthony...Medford Office, Boston.
- 536 Commonwealth Av.
- 1893 Donnelly, John Bernard...West Gardner (Gardner).
- 1885 Donoghue, Daniel Francis...Holyoke. 240 Maple St.
- 1894 Donoghue, Francis Dennis...Boston. 864 Beacon St.
- 1904 Donoghue, John Joseph...Worcester. Trumbull Sq.
- 1908 Donohue, Jeremiah Joseph...Worcester. 48 Vernon St.
- 1887 } Donovan, Michael Ricard...Lynn.
- 1904 } 101 North Common St.
- 1915 Donovan, Sylvester Edward New Bedford. 8 Wing St.
- 1911 Donovan, Thomas Roche...Fitchburg. 40 Fitchard St.
- 1910 Doonan, Henry Edward...South Hadley Falls.
- (South Hadley).
- 1880 Dorcey, James Edmund...Boston. 172 Harrison Av.
- 1900 Dorgan, Joseph Aloysius...Lawrence. 477 Essex St.
- 1909 Dorian, Kinton...Lawrence. 129 Concord St.
- 1885 Dorr, Charles Alonzo...Hingham. 304 Main St.
- 1901 Doucett, Frederick Luke...East Weymouth.
- (Weymouth).
- 1905 Douglas, Archibald John...Westfield. 38 Elm St.
- 1865 Douglass, John Abbott Amesbury. 167 Main St.
- †1906
- 1899 Dow, David Crooker...Cambridge. 6 Hilliard St.
- 1887 Dow, Edmund Scott...Allston (Boston).
- 40 Harvard Av.
- 1911 Dow, Frank Edward...Northampton.
- 16 Center St.
- 1897 Dow, George Farwell...Reading. 20 Woburn St.
- 1882 Dow, George William...Lawrence.
- 50 East Haverhill St.
- 1871 Dow, James Arthur...1913 Belmont. Payson Rd.
- 1914 Dowling, John Joseph...Boston. City Hospital.
- 1895 Downey, Charles John...Springfield. 317 Main St.

- 1908 Downey, Henry Arthur....Mittineague (West Spring-
field). 388 Westfield St.
1906 Downing, Andrew Francis..Cambridge. 501 Huron Av.
1904 Downing, Charles Harland..Everett. 59 Corey St.
1897 Downing, Franklin Chace..Lanesborough.
1909 Drake, Richard Alvin.....West Medford (Medford).
6 Irving St.
1883 Drake, William Abram....North Weymouth
(Weymouth).
1901 Draper, Alexis Lumb.....Dorchester (Boston).
1107 Washington St.
1885 Drew, Charles Aaron.....Worcester. City Hospital.
1904 Drew, Frederick Prescott..East Dedham (Dedham).
1895 Drew, Maria Emma.....Atlantic (Quincy).
39 Newbury Av.
1902 Dreyfus, Edna Weil.....Brookline. 30 Amory St.
1865 Driver, Stephen William..Cambridge. 5 Farwell Pl.
1915
1897 Drohan, James Henry.....Brookton. 204 Main St.
1888 Drummey, Nicholas Daniel..Dorchester (Boston).
533 Washington St.
1904 Drury, Dana Warren.....Roxbury (Boston).
Office, Boston.
407 Marlboro' St.
1906 Dubois, Eoline Church....Springfield. 10 Chestnut St.
1901 Duckering, Florence West..Boston. 483 Beacon St.
1900 Duckering, William West...Dorchester (Boston).
2 Warner St.
1908 Ducey, William Dwyer.....Brookton. 13 Clinton Av.
1894 Dudley, Augustus William..Cambridge. 1740 Mass. Av.
1891 Duff, John.....Charlestown (Boston).
5 Dexter Row.
1886 Duggan, John Thomas....Worcester.
226 Southbridge St.
1906 Dunbar, Francis Herbert..Mansfield. P. O. address
Boston. 46 Cornhill.
1893 Dunbar, Frank Collins....Roxbury (Boston).
9 Beethoven St.
1914 Dunham, Adeline Frances..Cambridge. 881 Mass. Av.
1913 Dunham, Harry Bartlett...Marion.
1894 Dunham, Henry Bristol....Glen Gardner, N. J.
N. Sanatorium.
1903 Dunn, Charles Hunter....Boston. 178 Marlboro' St.
1894 Dunn, Charles Stein.....Haverhill. 133 Main St.
1874 Dunn, William Aloysius...Boston. 139 Beacon St.
1913 Dunn, William Ambrose....Boston. 154 Richmond St.
1909 Dunphy, Henry Ambrose...Thorndike (Palmer).
1885 Durant, Charles Edwin...Haverhill. 105 Emerson St.
1879 Durell, Thomas Moulton...Somerville.
131 Highland Av.
1866 Durgin, Samuel Holmes....Duxbury. Millbrook P. O.
1867 Dutton, Charles.....Wakefield. 33 Avon St.
1906 Dutton, Julius Maltby....Westfield. 108 Elm St.
1902 Dutton, Richard.....Wakefield. 33 Avon St.
1890 Dwight, Edwin Welles....Boston. 19 Pearl St.
1896 Dwight, Henry Leonard...Copperopolis, Calif. Box 27.
1879 Dwight, James.....Falmouth. Office, Boston.
225 Beacon St.
1890 Dwyer, John Edward....Cambridge. 878 Mass. Av.
1911 Dwyer, John Edward, Jr....Cambridge. 878 Mass. Av.
1905 Dwyer, William Joseph....Cambridge. 118 Pearl St.
1882 } Dyer, Ebenezer Alden...{ Whitman.
1904 } 506 Washington St.

E
1884 Eames, George Franklin...Boston. 249 Newbury St.
1912 Earle, George Henry.....Boston. 1138 Boylston St.
1901 Eastman, Alexander Crane..Springfield. 6 Chestnut St.
1906 Eastman, Theodore...South Berwick, Me.
Jewett Office, Boston.
71 Marlboro' St.
1900 Easton, Elwood Tracy....Boston. 209 Newbury St.
1915 Eaton, Harold Burney....Boston. 222 Marlboro' St.
1914 Eaton, Henry Douglas....Stockbridge.
1906 Eaton, William Edward...U. S. Navy.
1879 Eaton, Wyllis Gilbert....Lowell. 417 Middlesex St.
1866 Eddy, George Stetson 1909..Newton. 73 Sargent St.
1861 Edes, Robert Thaxter 1912..Springfield.
251 Rimmon Av.
1913 Edsall, David Linn.....Milton. Office, Boston.
80 Marlboro' St.
1867 Edson, Ptolemy O'Meara..Roxbury (Boston).
1904
36 Elm Hill Av.
1894 Edwards, William Lothrop..Boston. 33 Gloucester St.
1897 Egan, John Joseph.....Gloucester. 52 Pleasant St.
1906 Ehrenfried, Albert.....Boston.
362 Commonwealth Av.
1887 Ehrlich, Henry.....Boston.
172 Commonwealth Av.
1915 Eidam, Charles Hermann..Lawrence.
334 Prospect St.
1913 Eisner, Maurice Solomon..Pittsfield. 86 North St.
1874 Ela, Walter 1914..Cambridge. 13 Ash St.
1907 Elder, Fred Orestes.....Wakefield. 22 Chestnut St.
1885 Eldridge, David Gorham...Dorchester (Boston).
15 Monadnock St.
1906 Ellum, Herbert William...Gardner. 29 Parker St.
1914 Eliot, Henry Whitney....Belchertown.
1900 Elliot, Henry Libbey.....Salem. 84 Washington Sq.
1877 Elliot, John Wheelock....Boston. 124 Beacon St.
1903 Elliott, Alfred.....Middleborough. Rock St.
1900 Elliott, Richard Andrew...Avon.
1873 Elliott, Russell Dunson...Boston. 154 Richmond St.
1908 Ellis, Arthur Henry.....Greenfield. 317 Federal St.
1905 Ellis, Edward Keith.....Hyde Park (Boston).
Office, Boston.
232 Clarendon St.
1880 Ellis, Frederic Warren....Monson. Oak St.
1873 Ellis, George Livingstone..Middleborough.
1913
135 Center St.
1899 Ellis, William Raymond...Brookline.
116 Thorndike St.
1915 Ellison, Daniel James....Lowell. 8 Merrimack St.
1899 Ellsworth, Samuel Walker..Quincy. 18 Summit Pk.
1899 Ely, Richard Skinner.....West Townsend.
(Townsend).
1913 Ely, Theodore Williams...Boston. 527 Beacon St.
1903 Emerson, Benjamin...Worcester. 37 Pearl St.
Kendall
1873 Emerson, Edward Waldo...Concord. Lowell Road.
1899 Emerson, Ernest Benjamin..State Farm (Bridgewater).
1893 Emerson, Francis Patten...Brookline. Office, Boston.
520 Commonwealth Av.
1903 Emerson, George Edward..South Weymouth (Wey-
mouth). Office, Boston.
543 Boylston St.
1893 Emerson, Herbert Clark...Springfield. 177 State St.
1911 Emerson, Nathaniel Waldo..Jamaica Plain (Boston).
118 Forest Hills St.
1900 Emerson, William Robie..Boston. 657 Boylston St.
Patten
1900 Emery, George Edwin.....Worcester. 280 Lincoln St.
1909 Emery, William Campbell..Dorchester (Boston).
430 Columbia Road.
1915 Emery, William Edward...Beverly. Beverly Hospital.
1870 Emery, William Henry....Roxbury (Boston).
109 Warwick St.
1905 Emmons, Arthur...Dover. Office, Boston.
Brewster, 2d
86 Bay State Road.
1915 Emmons, Henry Manning..Jamaica Plain (Boston).
19 Burroughs St.
1904 England, Albert Charles...Pittsfield. 124 North St.
1912 English, Martin Joseph....Boston.
514 Commonwealth Av.
1888 Ensforth, William Howard..East Boston (Boston).
40 Princeton St.
1894 Erb, Theodore Charles....Boston. 374 Marlboro' St.
1893 Ermentrout, Sallie Justina..Address unknown.
1881 Ernst, Harold Clarence...Jamaica Plain (Boston).
Office, Roxbury (Boston).
240 Longwood Av.
1899 Estabrook, Charles Taylor..Worcester. 390 Main St.
1912 Eustis, Richard Spelman...Boston. 329 Beacon St.
1903 Evans, Albert.....Boston. 409 Marlboro' St.
1904 Evans, Miner Harlow...Dorchester (Boston).
Amos, Jr. Office, Boston.
138 Newbury St.
1867 Eveleth, Edward Smith...East Gloucester
1908 (Gloucester).
20 Highland St.

1908 Eveleth, Samuel Chester...Marblehead.
137 Washington St.
1899 Everett, Eugene Ellsworth...Boston. 427 Marlboro' St.
1905 Everett, Frederick Luthr...Springfield. 10 Chestnut St.
1880 Everett, Oliver Hurd...Worcester. 53 Pearl St.
1865 Everett, Willard...Newton Upper Falls.
Shepard †1905 20 Summer St.
1900 Ewing, George Winburn...Middleton. Office, Peabody.
32 Main St.

F

1906 Fabyan, Marshal...Boston.
379 Commonwealth Av.
1899 Fair, John Francis...East Cambridge
(Cambridge).
390 Cambridge St.
1901 Fair, Robert Patrick...Boston. 451 Beacon St.
1899 Fairbanks, Arthur Willard...Brookline. Office, Boston.
591 Beacon St.
1897 Fales, Alonzo Cartland...Malden. 76 Pleasant St.
1912 Fallon, Joseph Francis...Brookline. 1 Kendall St.
1891 Fallon, Michael Francis...Worcester. 390 Main St.
1880 Farlow, John Woodford...Boston. 234 Clarendon St.
1895 Farnham, John Marshall...Worcester. 58 Pleasant St.
Willoughby
1874 Farr, Edwin Lawson...Brookline. 92 Thorndike St.
1908 Farr, Irvin Harris...Holyoke. 179 Chestnut St.
1915 Farrar, Lonnie Oliver...State Farm (Bridgewater).
1894 Farrington, Leander...Arlington Heights.
Morton 102 Florence Av.
1893 Faulkner, Herbert Kimball...Keene, N. H. 78 West St.
1891 Faulkner, William Edward...Boston. 290 Marlboro' St.
1905 Faunce, Calvin Barstow, Jr...Jamaica Plain (Boston).
Office, Boston.
95 Newbury St.
1905 Faxon, Eudora Winifred...Wrentham. State School.
1892 Faxon, Eudora Meade...Franklin. New Ray Block.
†1912
1907 Faxon, Nathaniel Wales...Stoughton. 4 Walnut Av.
1907 Faxon, William Otis...Stoughton. 4 Walnut Av.
1897 Fay, Frank Gleason...Worcester. 390 Main St.
1875 Fay, James Monroe...Northampton. 71 King St.
1911 Fay, Joseph Henry...Melrose.
6 West Emerson St.
1888 Fay, William Eastman...Brookline. Office, Boston.
366 Commonwealth Av.
1904 Feeley, Charles Philip...Cambridge. 1039 Mass. Av.
1914 Feeley, Walter Clarence...Cambridge. 265 Western Av.
1906 Felch, Carrie Innes...Boston. 355 Mass. Av.
1913 Felch, George Alfred...Boston. 591 Tremont St.
1906 Felch, Lewis Perley...Boston. 355 Mass. Av.
1912 Fennelly, Daniel John...Fall River. 52 Linden St.
1903 Fennessey, John Francis...Dorchester (Boston).
15 Adams St.
1915 Fenton, Alfred Archibald...Walpole.
1905 Fenwick, George Benson...Chelsea. 24 Gardner St.
1901 Ferguson, Robert Henry...East Orange, N. J.
9 North Munn Av.
1873 Fernald, Charles Augustus...Boston.
†1912 1483 Washington St.
1903 Fernald, Guy Goodwin...Concord Junction
(Concord). Assabet Av.
1895 Fernald, Walter Elmore...Waverley (Belmont).
P. O. Box 344.
1904 Ferrin, William Warren...Haverhill. 77 Emerson St.
1906 Field, Henry Martyn...Norwood.
784 Washington St.
1904 Field, Martin Thomas...Salem. 23 Winter St.
1900 Finch, George Hardy...Springfield. 310 Main St.
1907 Finegan, Daniel Joseph...Gloucester. 83 Middle St.
1912 Finkelstein, Harry...Boston. 342 Hanover St.
1911 Finkelstein, Nathan...Pittsfield. 86 North St.
1911 Finlayson, Alan Daniel...Warren, Pa. State Hosp.
1890 Finn, Edward William...Dedham. 5 Franklin Sq.
1913 Finnegan, Francis...Lowell.
Augustine 10 East Merrimack St.
1913 Finnegan, Philip Joseph...Salem. 92½ Essex St.
1914 Finnerty, Charles William...Somerville. 761 Broadway.
1884 Finnigan, Patrick Joseph...Cambridge.
1412 Cambridge St.

1904 Fischbein, Louis...Boston. 382 Newbury St.
1897 Fish, Ernest Clifford...Melrose. 11 Wyoming Av.
1897 Fish, John Euclid...Canton.
Mass. Hospital School.
1904 Fish, Louis...Fitchburg. 25 Myrtle Av.
1873 Fisher, Chester Irving...New York, N. Y.
1925 7th Av.
1915 Fisher, Gertrude Guild...Roxbury (Boston).
74 Fenwood Road.
1902 Fisher, Irving Jewell...West Newton (Newton).
79 Chestnut St.
1910 Fishman, Maurice...Lowell. 40 Middlesex St.
1888 Fisk, Arthur Lyman...New York, N. Y.
41 West 50th St.
1886 Fiske, Eustace Lincoln...Fitchburg. 20 Pichard St.
1891 Fitz, George Wells...Boston. P. O. address,
Peconic, N. Y.
1913 Fitz, Reginald...Roxbury (Boston).
P. B. Brigham Hospital.
1894 Fitzgerald, Clara Pauline...Worcester. 137 Pleasant St.
1892 Fitzgerald, James Bernard...Boston. 393 Mass. Av.
1906 Fitzgerald, John Joseph...Haverhill. 111 Emerson St.
1903 Fitzpatrick, John Joseph...Charlestown (Boston).
50 High St.
1910 Fitz-Simmons, Henry...Jamaica Plain (Boston).
Joseph Office, Boston.
272 Newbury St.
1902 Flagg, Elisha...Boston.
190 Commonweal Av.
1909 Flagg, Harry Howard...Charlestown (Boston).
30 Elm St.
1913 Flaherty, Edward James...Tewksbury.
State Infirmary.
1914 Fleet, William Ernest...Cambridge. 9 Columbia St.
1914 Fleming, Edward Rahn...Medford. 322 Boston Av.
1904 Fleming, Patrick Joseph...Cambridge. 411 Huron Av.
1903 Fleming, Peter Joseph...Mattapan (Boston).
1258 Blue Hill Av.
1902 } Fletcher, Robert Swan...Oxford. Charlton St.
1909 }
1893 Fletcher, Robert Whitney...South Boston (Boston).
783 Broadway.
1905 Flett, Penelope McNaughton...Everett. 15 Fairlawn St.
1882 Flood, Everett...Palmer.
Monson State Hospital.
1910 Flournoy, Thomas...Pittsfield. 742 North St.
1905 Floyd, Cleaveland...Boston. 246 Marlboro' St.
1893 Flynn, John Joseph...Pittsfield. 183 North St.
1902 Flynn, John Joseph...Worcester. 10 Grand St.
1883 Fogerty, William Clemmons...Worcester. 98 Chandler St.
1880 Fogg, Irving Sylvester...Norwood.
767 Washington St.
1913 Foley, Thomas Brinsley...Boston. 85 Westland Av.
1894 Foley, Timothy John...Worcester. 28 Portland St.
1910 Forbes, Alexander...Milton. Harland St.
1893 Ford, John Francis...Roslindale (Boston).
8 Walter St.
1914 Forster, John Ferguson...Holyoke. 277 Suffolk St.
Cooke
1901 Forster, Robert William...Lawrence. 279 Broadway.
1895 Fosgate, Elmer Gilman...Ashburnham.
1883 Foskett, George Mason...Worcester. Stark Rd.
1914 Foss, George Herbert...Springfield.
530 Summer St.
1909 Foss, Ralph Emery...Peabody. 97 Main St.
1884 Foster, Charles Chauncy...Cambridge. 8 Elmwood Av.
1904 Foster, Ellis Edwin...New Bedford.
271 Union St.
1883 Foster, Horace Kendall...Peabody. 2 Park St.
1890 Fourtin, Edmund Randolph...Waltham. 54 Grant St.
1909 } Peaslee
1911 Fox, Michael Bernard...Worcester. 6 Coral St.
1887 Fox, William Yale...Taunton. 26 Second St.
1915 Fraim, Irving Williams...Worcester. City Hospital.
1894 Frame, Joseph...Rockland. 39 Webster St.
1891 Francis, Carleton Shurtliff...Brookline. 26 Davis Av.
1887 Francis, George Hills...Brookline. 295 Walnut St.
1911 Frank, Morris...Roxbury (Boston).
106 Humboldt Av.
1902 Franz, Adolph...Holyoke. 266 Maple St.
1911 Fraser, Archibald McKay...Boston. 69 Newbury St.

- 1880 Fraser, John Chisholm....East Weymouth.
(Weymouth).
1915 Fraser, Somers.....Boston. Relief Station,
Haymarket Sq.
1913 Fraser, William Leslie....Lynn. 812 Summer St.
1915 Frasier, Joseph Anthony....New Bedford. 265 Main St.
1911 Frawley, William Thomas..Pittsfield. 184 North St.
1905 Freedman, Louis Mark....Dorchester (Boston).
Office, Boston.
419 Boylston St.
1894 Freeman, Franklin Willard..Lynnfield.
P. O. Wakefield, R. F. D.
1900 French, Charles Ephraim..Lowell. 9 Central St.
1887 French, Charles Lindol....Clinton. 271 High St.
1893 French, George Henry....Winthrop. 300 Pleasant St.
1892 French, John Marshall....Milford. 2 South Main St.
1911 French, Ralph Winward....Fall River. 151 Rock St.
1914 Friedman, Benjamin....Boston. 43 McLean St.
1901 Friedman, Leo Victor....Newton Center. Office,
Boston. 425 Marlboro' St.
1910 Friedman, Nathan.....Boston.
1038 Washington St.
1897 Frost, Edward Clayton....Campello (Brookton).
68 Chestnut St.
1910 Frost, Henry Pinckney....Dorchester (Boston).
State Hospital
1906 Frothingham, Channing, Jr..Boston. 395 Marlboro' St.
1887 Frye, Edmund Bailey....Boston. 21 Chestnut St.
1909 Fuller, Andrew Howard....Cushman (Amherst).
1903 Fuller, Charles Benjamin..Waltham. 826 Main St.
1890 Fuller, Daniel Hunt....Philadelphia, Pa.
49th and Market Sts.
1907 Fuller, Ernest Page....Lawrence. 301 Essex St.
1894 Fuller, Frederick Henry....Walpole.
1892 Fuller, James Robert....Andover. 68 Central St.
1915 Fuller, Solomon Carter....Worcester. State Hospital.
1898 Fullerton, Walter Wilson..Brookton. 106 Main St.
1911 Funnell, Wilfred Goldwin..Cambridge. Office, Boston.
156 Huntington Av.
- G**
- 1905 Gabler, George Lewis....Holyoke. 149 Chestnut St.
1905 Gafney, Harry Dabol....Ware. 45 Main St.
1909 Gage, Arthur Tenney....Melrose Highl'ds (Mel-
rose). 250 Franklin St.
1906 Gage, Fred Leon.....Lowell. 9 Central St.
1886 Gage, Homer.....Worcester. 72 Pearl St.
1884 Gage, James Arthur....Lowell. 64 Central St.
1907 Gahan, Patrick Francis....Medford. 19 Washington St.
1891 Gale, George Washington..East Saugus (Saugus).
68 Lincoln Av.
1901 Gale, Harold Adams....Winchester. Office, Boston.
111 Newbury St.
1906 Gallagher, John Henry Chicopee. 105 Center St.
Connaughton
1912 Gallagher, Nicholas Malden. 221 Highland Av.
Ambrose
1907 Gallagher, Thomas Morton..Newton. 34 Channing St.
1906 Galligan, Edward Joseph..Taunton.
10 North Pleasant St.
1882 Galligan, Eugene Thomas..Roxbury (Boston).
84 Warren St.
1888 Gallison, Ambrose John....Franklin. 259 Dean Av.
1910 Gallison, James Murry....Boston. 49 Hereford St.
1893 Gallivan, William Joseph..South Boston (Boston).
743 Broadway.
1883 Galloupe, Charles William..Boston.
188 Commonwealth Av.
1904 Galvin, Augustus Hughes..Springfield. 423 Main St.
1901 Galvin, William.....Blackinton
(Williamstown).
1887 Gannett, William Boston. 274 Marlboro' St.
Whitworth
1903 Gardner, Archibald Robert..Lowell. 64 Central St.
1881 Gardner, Clarence Northampton. 78 Main St.
Rhodolphus
1912 Gardner, Edwin Daniels...New Bedford.
57 Campbell St.
1900 Gardner, Harrie Milton...Cambridge.
128 Magazine St.
- 1913 Garipay, Ellsworth Peter..Lynn. 147 Franklin St.
1875 Garland, Albert Stone Gloucester. 18 Pleasant St.
†1908
1874 Garland, George Minot....Boston. 227 Newbury St.
1905 Garland, Roy.....Gloucester. 17 Pleasant St.
1895 Gates, Ernest A.....Springfield.
49 North Main St.
1899 Gavin, John Harrison....Roxbury (Boston).
346 Dudley St.
1905 Gay, Clarence Bertram....Fitchburg. 47 Day St.
1903 Gay, Fritz Walte.....Malden. 105 Salem St.
1868 Gay, George Washington..Chestnut Hill (Newton).
Office, Boston.
665 Boylston St.
1903 Gay, Herbert Seymour....Boston. 1087 Boylston St.
1893 Gay, Warren Fisher.....Boston. 409 Marlboro' St.
1914 Gaylord, James Frederick..Springfield. 700 State St.
1902 G  n  reux, Joseph Olivier..Webster. 18 Main St.
1907 George, Arial Wellington..Boston. 43 Bay State Rd.
1897 George, Arthur Phillips...Haverhill. 143 Main St.
1908 George, Frank William....Worcester. 6 High St.
1908 George, Leslie Handlin....Bradford (Haverhill).
118 Main St.
1911 Gerber, Isaac.....Providence, R. I.
347 Thayer St.
1901 Germain, Harry Homer....Boston. 43 Bay State Rd.
1882 Gerould, Joseph Bowditch..North Attleborough.
34 High St.
1896 } Gerstein, Maurice.....{ Roxbury (Boston).
1913 } 493 Warren St.
1915 Gervais, Harriet Marion....Roxbury (Boston).
74 Fenwood Road.
1885 Getchell, Albert Colby....Worcester. 6 Linden St.
1912 Ghoreyeb, Albert Alphonso Boston. 483 Beacon St.
Wood
1886 Gibbs, Linnaeus Victor Huntington.
†1907
1883 Gibbs, Locero Jackson....Chicopee Falls (Chicopee).
†1915 33 Broadway.
1907 Giblin, Francis Joseph....Dorchester (Boston).
33 Adams St.
1909 Giddings, Harold Girard...Allston (Boston).
Office, Boston.
90 Exeter St.
1869 Gifford, Benjamin Dods Chatham. Cross St.
†1913
1886 Gifford, John Henry.....Fall River. 320 Rock St.
1908 Giguere, Alfred Joseph....Lowell. 777 Merrimack St.
1887 Gilbert, John.....Fall River. 254 Locust St.
1898 Gilbert, Louis Whitmore..Brookline. 1470 Beacon St.
1915 Gilchrist, John Milton....Springfield. 52 High St.
1906 Gile, Frank Herbert, Jr....Braintree.
420 Washington St.
1892 Gile, John Morton.....Hanover, N. H.
1 Maynard St.
1914 Gillilan, Donald Robert...Worcester, State Asylum.
1905 Gillis, John Ewen.....West Somerville (Somer-
ville). 1109 Broadway.
1906 Gilman, Charles Sleeper...Brookline. Office, Boston.
419 Boylston St.
1872 Gilman, Eugene Albert Dorchester (Boston).
†1907 677 Dudley St.
1909 Gilman, Florence.....Northampton. 33 Elm St.
1887 Gilman, Warren Randall...Worcester. 10 Oxford St.
1906 Gilpatrick, Roy Hawkes....Boston. 1069 Boylston St.
1878 Ginn, David Richard....Dennisport (Dennis).
1906 Giroux, Charles.....Three Rivers (Palmer).
1906 Glass, James.....Framingham. 61 Concord St.
1896 Glendenning, Robert Manchester. 8 Church St.
Thompson
1915 Glidden, Edson William..Lakeville.
2d. State Sanatorium.
1912 Glunts, David.....Roxbury (Boston).
165 Harold St.
1898 Goddard, Henry Edward....Brookton. 21 Goddard Rd.
1906 Goddard, Samuel Warren..Brookton. 21 Goddard Rd.
1905 Goddu, Louis Adalor Boston. 407 Marlboro' St.
Oliver
1914 Godfrey, Henry White....Auburndale (Newton).
14 Hancock St.

- 1901 Godfrey, Joseph Witter....Swampscott. Office, Lynn.
209 Union St.
- 1904 Godfrey, Thomas Francis...Springfield. 101 Union St.
- 1900 Golden, Lazarus.....Boston. 99 Green St.
- 1906 Goldsburly, Paul Williams...Warwick.
- 1888 Goldthwait, Joel Ernest...Boston. 372 Marlboro' St.
- 1893 Goldthwaite, Seth Vale Allston (Boston).
†1914 1118 Commonwealth Av.
- 1906 Good, Frederick Leo.....Brookline. Office, Boston.
95 Newbury St.
- 1892 Goodale, Joseph Lincoln...Boston. 255 Beacon St.
- 1904 Goodall, Harry Winfred...Boston. 205 Beacon St.
- 1881 Goodell, George Zina...Salem. 62 Federal St.
- 1906 Goodell, William.....Springfield. 6 Chestnut St.
- 1890 Goodman, Samuel.....Roxbury (Boston).
148 Townsend St.
- 1902 Goodridge, Frederick James Cambridge. 5 Appian Way
- 1892 Goodwin, James Joseph....Clinton. 202 Church St.
- 1861 } Goodwin, Richard James { Malden.
1885 } Plummer †1903 } 481 Pleasant St.
- 1871 Gordon, John Alexander...Quincy. 1200 Hancock St.
- 1890 Gordon, Stephen Masury...Fall River. 318 Prospect St.
- 1905 } Gorham, George Hartley { West Roxbury (Boston).
1910 } 81 Corey St.
- 1915 Gosline, Harold Imman....Worcester. State Hospital.
- 1896 Goss, Arthur Vincent....Taunton. State Hospital.
- 1869 Goss, Francis Webster....Sacramento, Calif.
1014 Yardley Av.
- 1907 Gould, Chester Harlow....Braintree. 400 Washington St.
- 1888 Gould, Clarke Storer.....Norwood. 486 Washington St.
- 1899 Grady, Patrick Anthony Clinton. 104 School St.
Salmon
- 1913 Grady, Thomas Francis....Lynn. 540 Summer St.
- 1915 Grady, Thomas Henry....Clinton. 76 Walnut St.
- 1873 Graham, Douglas.....Brookline. Office, Boston.
Hotel Brunswick
- 1910 Graham, Jay Percy.....Springfield. 137½ State St.
- 1911 Grainger, Edward John....Winthrop. 304 Winthrop St.
- 1882 Grainger, William Henry...East Boston (Boston).
619 Bennington St.
- 1901 Grandison, Wilfred George.Charlestown (Boston).
65 High St.
- 1903 Granger, Frank Butler....Boston. 591 Beacon St.
- 1882 Granger, Frank Clark....Randolph.
- 1893 Granger, Karle Henry....South Weymouth (Weymouth).
- 1895 Grant, James Henry.....Lynn. 148 South Common St.
- 1896 Grant, William Herbert....Belmont. Office, Boston.
543 Boylston St.
- 1904 Grant, William Victor....Lawrence. 253 Essex St.
- 1905 Graves, Benjamin Augustus Dorchester (Boston).
178 Bowdoin St.
- 1904 Graves, Robert John.....Concord, N. H.
3 North State St.
- 1901 Graves, William Phillips...Boston. 244 Marlboro' St.
- 1901 Gray, Alice Maud.....Roxbury (Boston).
2 St. James St.
- 1896 Gray, Elizabeth Taylor...Roxbury (Boston).
2 St. James St.
- 1891 Gray, George Henry.....Lynn. 11 Lynn Shore Drive.
- 1915 Gray, Horace.....Roxbury (Boston).
P. B. Brigham Hospital.
- 1914 Greeley, Hugh Payne.....Waukesha, Wis.
- 1877 Green, Charles Montreville.Boston. 78 Marlboro' St.
- 1868 Green, John Orne †1912 Boston. 267 Newbury St.
- 1906 Green, Robert Montreville.Boston. 78 Marlboro' St.
- 1855 Green, Samuel Abbott Boston. 1154 Boylston St.
†1901
- 1901 Greene, Daniel Crosby, Jr..Boston. 483 Beacon St.
- 1915 Greene, Edward Chace....Northampton. State Hospital.
- 1887 Greene, Edward Miller....Boston. 45 Chestnut St.
- 1915 Greene, Jeremiah Augustus Cambridge. 2236 Mass. Av.
- 1904 Greene, Ransom Alphonso..Palmer. Monson State Hospital.
- 1887 Greene, Ray Woodville....Worcester. 21 West St.
- 1895 Greene, Thomas Francis...Roxbury (Boston).
322 Warren St.
- 1896 Greene, William Henry...Roxbury (Boston).
322 Warren St.
- 1871 Greenleaf, John Ruggles Gardner. 42 Chestnut St.
†1908
- 1900 Greenough, Clara Mary....Greenfield. 17½ Federal St.
- 1898 Greenough, Robert Battey.Boston. 10 Gloucester St.
- 1888 Greenwood, Allen.....Wellesley Hills. Office, Boston.
101 Newbury St.
- 1905 Greenwood, Arthur Moses..Marblehead. 69 Pleasant St.
- 1881 Greenwood, Sewell Elliot..Templeton.
- 1907 Gregg, Donald.....Brookline. 701 Boylston St.
- 1915 Grey, Ernest George.....Roxbury (Boston).
P. B. Brigham Hospital.
- 1884 Griffin, Arthur George....Malden. 195 Pleasant St.
- 1903 Griffin, Walter Alden.....Sharon.
- 1904 Grimes, Loring.....Swampscott. 129 Burrill St.
- 1896 Griswold, Merton Lyman...Uxbridge. South Main St.
- 1915 Grochinsky, Herman.....New Bedford. 54 Russell St.
- 1893 Grouard, John Shackford..Nantucket.
- 1904 Grover, Arthur Leon.....Iowa City, Iowa. College of Medicine.
- 1914 Grover, Joseph Isaac.....Mattapan (Boston).
1329 Blue Hill Av.
- 1883 Gruver, Samuel James....Brookton. 106 Main St.
- 1912 Guild, Bruno Thurber....Shelburne Falls (Shelburne).
- 1887 Guild, Edgar Hunt.....Springfield. 137½ State St.
- 1910 Guild, Edward Frank.....Chelsea. 9 Crescent Av.
- 1909 Guild, Frederick Washburn.Grafton. South St.
- 1896 Guild, Thomas Ezra.....Mattapan (Boston).
1550 Blue Hill Av.
- 1914 Gunter, Fred Clarke.....Somerville. 141 Walnut St.
- 1913 Guthrie, Andrew Doherty..Medford. 407 Salem St.
- 1914 Gwinnell, Alfred Weston...Brighton (Boston).
553 Washington St.
- 1914 Gwynne, Samuel Carlton...Worcester. 346 Grafton St.

H

- 1905 Haché, Henry Clement....Somerville. 464 Broadway.
- 1879 Haddock, Charles Whitney.Beverly. 156 Cabot St.
- 1911 Hagerty, Harry John....Worcester. 1 Main St.
- 1911 Hagerty, Joseph James....Norwood. 699 Washington St.
- 1911 Hagopian, Levon George...Lynn. 26 South Common St.
- 1885 Hahn, Albert Johann.....Patterson, N. J.
- 1911 Haigh, Gilbert William...Worcester. 189 West Boylston St.
- 1900 Haines, Ignatius.....Boston. 178 Devonshire St.
- 1914 Haley, William Thomas....Boston. City Hospital.
- 1915 Hall, Charles Francis Newburyport. 202 High St.
Adams
- 1911 Hall, Gardner Wells.....Boston. 475 Beacon St.
- 1877 Hall, Harry Porter.....Leominster. 70 West St.
- 1896 Hall, Herbert James....Marblehead. Devereux Mansion.
- 1903 Hall, John Baptiste, Jr...Roxbury (Boston).
60 Windsor St.
- 1902 Hall, Walter Davis.....Port Clyde, Me.
- 1885 Hall, William Dudley....Boston. 416 Marlboro' St.
- 1907 Hallett, Edward Bangs....Gloucester. 63 Middle St.
- 1906 Halligan, Edward Maurice.Reading. 18 Salem St.
- 1910 Hallisey, Joseph Edward...Dorchester (Boston).
691 Columbia Road.
- 1881 Halloran, Michael Joseph...Worcester. 42 Green St.
- 1898 Halloran, Timothy Joseph..Lowell. 10 East Merrimack St.
- 1890 Halpin, Andrew James....Lowell. 22 Central St.
- 1906 Halsall, Mary Elizabeth...Winthrop. Office, East
Boston (Boston).
1024 Pennington St.
- 1912 Hamblen, Edward Everett.Bedford.
- 1912 Hamblen, Howard.....Maynard. Walnut St.
- 1914 Hamblet, Mary Lucia.....Waltham. R. I.
- 1908 Hamilton, Albert John Boston. 69 Newbury St.
Adams

- 1915 Hersam, Norman Paul....Stonham 20 Hersam St.
 1880 Hersey, Freeman Clarke Boston. 405 Marlboro' St.
 †1914
 1911 Hersey, Harold Waters....Winchester. Office,
 Boston. Mass. Gen. Hosp.
 1896 Hewes, Henry Fox....Boston. 116 Marlboro' St.
 1882 Hewins, Parke Woodbury....Wellesley Hills. Office,
 Boston. 20 Beacon St.
 1897 Hewitt, Clarence Elbert....Springfield. 796 State St.
 1902 Hewitt, William Oakes....Attleborough.
 34 Sanford St.
 1911 Heydenmann, Martin....Boston. 1069 Boylston St.
 1903 Hickey, John Joseph....Peabody. 40 Main St.
 1906 Hicks, George Henry....Fall River
 1973 South Main St.
 1908 Higginbotham, Fred Watertown.
 Augustus 98 Mt. Auburn St.
 1893 Higgins, Frank Albert....Boston.
 384 Commonwealth Av.
 1914 Higgins, George Vincent....Randolph. Warren St.
 1894 Higgins, James Haydyn....Union Village, Vt.
 1868 Hildreth, John Lewis †1909. Winchester. 55 Fletcher St.
 1878 Hill, Edgar Dwight....Plymouth. 27 Court St.
 1896 Hill, George Hillard....Worcester. 15 High St.
 1904 Hill, George Jackson....Beverly. 548 Cabot St.
 1901 Hill, George Sumner....Boston. 295 Beacon St.
 1886 Hill, Ira Clark....Springfield. 137½ State St.
 1913 Hill, Lawrence Richardson.Pittsfield.
 House of Mercy Hospital.
 1914 Hill, Lewis Webb....Roxbury (Boston).
 300 Longwood Av.
 1904 Hill, Thomas Chittenden...Boston.
 384 Commonwealth Av.
 1903 Hillard, James Pearce....Springfield. 354 Walnut St.
 1901 Hills, Charles Everett....South Natick (Natick).
 1895 Hills, Frederick Lyman. Bangor, Me.
 1898 Eastern Maine Hospital.
 1874 Hills, William Barker Brookline. Office, Boston.
 19 Pearl St.
 †1915
 1914 Hilton, John Joseph Lawrence. 336 Haverhill St.
 Herron
 1915 Hiltbold, Werner....Easthampton. 1 Clark St.
 1905 Hillebrand, Frederick....Cohasset. Main St.
 1905 Hinchey, Richard....Waltham. 17 Pine St.
 1899 Hinchey, James William.Brookline. Office, Boston.
 419 Boylston St.
 1911 Hinds, Robert Watson....Address unknown.
 1913 Hinton, William Augustus.Cambridge. Office, Boston.
 Mass. Gen. Hospital.
 1889 Hipkiss, George....Medford. 284 Salem St.
 1909 Hirsch, Henry Leon....Springfield. 172 Main St.
 1882 Hitchcock, Edward....Boston. 32 State House.
 1911
 1890 Hitchcock, Henry Russell.Plymouth. 36 Main St.
 1895 Hitchcock, John Sawyer....Northampton. 160 Main St.
 1900 Hixon, Edwin Colfax....Brookline. Office, Boston.
 419 Boylston St.
 1880 Hobbs, Ezra Allen †1911 Framingham. 40 Union Av.
 1913 Hoberman, Samuel....Malden. 217 Bryant St.
 1907 Hoch, Theodore Augustus..Waverley (Belmont).
 McLean Hospital.
 1882 Hodgdon, Andrew Hall....Dedham. 110 Maple Pl.
 1903 Hodgdon, Ralph Franklin.Somerville. 107 Pearl St.
 1894 Hodges, Almon Danforth...Roxbury (Boston).
 2 St. James St.
 1902 Hodskins, Morgan Palmer.
 Brewster Monson State Hospital.
 1898 Hogan, Joseph Ambrose....Lawrence. 537 Essex St.
 1893 Hogner, Richard Per Boston. 365 Mass. Av.
 Gustaf
 1907 Hoit, Henry Ambrose....Pasadena, Calif.
 1818 Walworth Av.
 1906 Hoitt, Charles Lewis....Lynn. 83 Franklin St.
 1883 Hoitt, Eugene Gorham....Dorchester (Boston).
 51 Pleasant St.
 1902 Holbrook, Bradbury....Waltham. 802 Main St.
 1910 Holbrook, Charles Albert...Haverhill.
 50 Merrimack St.
 1862 Holbrook, Silas Pinckney East Douglas (Douglas).
 †1903 20 Pleasant St.
 1882 Holden, Charles Sumner....Attleborough.
 21 South Main St.
 1880 Holden, Eugene Martin....New York, N. Y.
 1 Madison Av.
 1883 Holden, William Daniel....Haverhill. 74 Emerson St.
 1897 Holland, Hubert Thomas....Jamaica Plain (Boston).
 423 Center St.
 1908 Hollings, Byam....Boston. Mass. Gen. Hosp.
 1903 Holmberg, Carl Lester....Campello (Brockton).
 Magnus 1106 Main St.
 1909 Holmes, Arthur Brewster...Kingston. Main St.
 1913 Holmes, Daniel Henry....Middleborough.
 15 School St.
 1897 Holmes, Edgar Miller....Boston. 531 Beacon St.
 1906 Holmes, George Winslow...Brookline. Office, Boston.
 205 Beacon St.
 1900 Holmes, Harry Bigelow....Adams. 37 Park St.
 1902 Holmes, Howard Fowler...Tewksbury.
 State Infirmary.
 1910 Holmes, John Franklin....Manchester, N. H.
 951 Elm St.
 1895 Holmes, May Salona....Worcester.
 Belmont Hospital.
 1907 Holt, Charles Herbert....Pawtucket, R. I.
 107 Mineral Spring Av.
 1900 Holt, Frank Hammett....Chicago, Ill.
 Michael Reese Hospital.
 1883 Holyoke, Frank....Holyoke. 441 High St.
 1914 Holzer, William Francis....Winchendon. 35 School St.
 1904 Homans, John....Roxbury (Boston). Office,
 Boston. 164 Beacon St.
 1911 Honeij, James Albert....Cambridge. 2 Avon St.
 1897 Hood, Mary Gould Brookline. 73 Longwood Av.
 †1915
 1909 Hoole, John Edward....Somerville.
 385 Highland Av.
 1900 Hopkins, Bertrand Hiram...Ayer. Washington St.
 1895 Hopkins, Frederick Eugene.Springfield. 25 Harrison Av.
 1912 Hopkins, John Wilson....Washington, D. C.
 Washington Sanatorium.
 1911 Hopkins, William Thorpe...Lynn. 7 Atlantic St.
 1906 Hopkinson, George....Newton. Office, Boston.
 419 Boylston St.
 1906 Horne, Lester Wallace....Fairhaven. 32 Union St.
 1914 Hornor, Albert Aurelius....Boston. 86 Bay State Rd.
 1915 Horrax, Gilbert....Roxbury (Boston).
 P. B. Brigham Hospital.
 1914 Horsman, Hiram Lionel...Worcester. State Asylum.
 1906 Hosley, Walter Alexis....Springfield.
 145 Clarendon St.
 1885 Hough, Garry de Nerville..New Bedford.
 542 County St.
 1914 Houghton, Niedhard Boston. 220 Clarendon St.
 Hahnemann
 1906 Houghton, Richard Henry...East Boston (Boston).
 308 Sumner St.
 1891 Houghton, Silas Arnold...Brookline. 14 Pleasant St.
 1882 Houston, John Alexander...Northampton.
 State Hospital.
 1908 Howard, Alonzo Gale....Boston. 636 Beacon St.
 1882 Howard, Amasa....Chelmsford.
 1911 Howard, Arthur Allison...Brookline. Office, Boston.
 520 Commonwealth Av.
 1898 Howard, Eugene Henry....Pittsfield. 246 North St.
 1901 Howard, Frederic Hollis...Williamstown.
 50 Spring St.
 1885 Howard, Herbert Burr....Roxbury (Boston). Peter
 Bent Brigham Hospital.
 1899 Howard, Joseph Francis...Lawrence. 6 Avon St.
 1885 Howard, Margaret Emily Roxbury (Boston). Peter
 Pagelsen Bent Brigham Hospital.
 1908 Howe, George Plummer...Lawrence.
 155 Haverhill St.
 1904 Howe, Harry Newell....Greenfield. 4 Bank Row.
 1899 Howe, Joseph Dimock....Pittsfield. 42 North St.
 1876 Howe, Octavius Thorndike Boston. 154 Beacon St.
 1885 Howe, Oliver Hunt....Cohasset. Main St.
 1898 Howe, Walter Clarke....Boston. 303 Beacon St.
 1900 Howell, William Wescott...West Roxbury. Office, Boston.
 279 Clarendon St.
 1912 Howes, Frank Miller....Fairhaven. 84 Laurel St.

- 1905 Jones, Frederick Elmer...Brookline. Office, Roxbury.
(Boston). 507 Warren St.
- 1887 Jones, Gilbert Norris.....Wellesley Hills
(Wellesley).
- 1908 Jones, James Ambrose....Lynn.
173 North Common St.
- 1897 Jones, John Clarke.....Brookline. 56 Hawes St.
- 1892 Jones, Lombard Carter.....Falmouth.
- 1892 Jones, Lyman Asa.....North Adams.
141 Church St.
- 1898 Jones, Mary Scott.....Boston. 82 St. Stephen St.
- 1903 Jones, Raymond Child.....Fitchburg.
4 Ashburnham St.
- 1911 Jones, Robert Le Roy....Lowell. 219 Central St.
- 1905 Jones, Wellington West....Housatonic (Great Bar-
rington). 41 Main St.
- 1893 Jones, William Marks....Lowell. 145 Merrimack St.
- 1859 Jordan, Charles #1895 Wakefield. 9 Jordan Av.
- 1911 Jordan, Ernest Major.....Boston. 502 Beacon St.
- 1873 Jordan, George Albert...Worcester. 46 Myrtle St.
#1913
- 1905 Jordan, John Franklin....Peabody. 77 Lynn St.
- 1894 Joslin, Elliott Proctor....Boston. 81 Bay State Rd.
- 1911 Joslyn, Arthur Everett....Lynn. 211 Western Av.
- 1901 Joubert, Fred Robert....Cambridge. 3 Garden St.
- 1906 } Joyce, Thomas Francis...Lawrence. 296 Broadway.
1912 }
- 1914 Judd, Ernest Hart.....Springfield. 685 State St.
- 1912 Juddins, Charles Louville...Lynn. 7 Mason St.
Mason
- 1891 Juddins, Frank Louville...Lynn. 7 Mason St.
- 1915 Jurist, Charles.....Springfield. 1141 North St.
- K**
- 1890 Kaan, George Warton....Brookline. Office, Boston.
419 Boylston St.
- 1914 Kaplovitch, Henry.....Haverhill.
50 Merrimack St.
- 1904 Katsainos, George Michel..Boston. 106 Huntington Av.
- 1889 Kean, Michael Edward....Manchester, N. H.
780 Elm St.
- 1903 Keane, Henry Joseph....Everett. 385 Broadway.
- 1913 Keany, Francis Joseph....Boston. 73 Marlboro' St.
- 1901 Kearney, John Henry.....Fitchburg. 80 Wallace St.
- 1909 Kearney, Joseph Patrick...Lowell.
10 East Merrimack St.
- 1886 Keefe, Daniel Edward....Springfield. 127 Main St.
- 1880 } Keefe, Patrick Henry...{ Providence, R. I.
1902 } 257 Benefit St.
- 1889 Keegan, Charles Andrew....Arlington. 734 Mass. Av.
- 1906 } Keeler, William Basil...{ Roxbury (Boston).
1911 } 470 Warren St.
- 1902 } Keenan, George Francis...Boston. 520 Beacon St.
1914 }
- 1897 Keenan, Herbert John....South Boston (Boston).
254 Broadway.
- 1910 Keever, Henry Floyd.....Auburndale (Newton).
255 Melrose St.
- 1904 Keith, Halbert Lynn.....Milford. 255 Main St.
- 1884 Keith, Wallace Cushing...Brookton.
237 North Main St.
- 1892 Keleher, William Henry...Woburn. 48 Pleasant St.
- 1910 Kelleher, Jeremiah Edward.Haverhill. 170 Winter St.
- 1896 Kelleher, Patrick Francis..Cambridge. 1713 Mass. Av.
- 1912 Kelley, Clarence Moore....Westminster.
- 1914 Keller, Edward Joseph....Watertown. 218 Main St.
- 1903 Keller, Joseph Henry...Dorchester (Boston).
Hart The Peabody. Peabody Sq.
- 1914 Kelley, Lawrence Kendall..Peabody. 15 Chestnut St.
- 1914 Kelley, Robert Edward...Mattapan (Boston).
Stack 249 River St.
- 1883 Kellogg, Edward Brinley...Boston. 854 Beacon St.
- 1912 Kellogg, Foster Standish...Boston. 96 Bay State Rd.
- 1892 } Kellogg, Frederick Leroy...{ Boston.
1899 } 306 Commonwealth Av.
- 1908 Kelly, John Michael.....Dorchester (Boston).
182 Bowdoin St.
- 1901 Kelly, Michael.....Fall River. 225 Third St.
- 1893 Kelly, William P.....Pittsfield. 61 Union St.
- 1913 Kemp, Howard Martin.....Turner's Falls (Montague).
129 Avenue A.
- 1915 Kemp, Lyander Schaffner..Canton. Mass. Hosp. Sch.
- 1913 Kendrick, Joseph...Dorchester (Boston).
Thomas 938 Dorchester Av.
- 1895 } Kennard, Harry Delano...Peabody. 84 Main St.
1902 }
- 1877 Kennealy, John Henry....Brookline. Office, Roxbury
(Boston). 1570 Tremont St.
- 1898 Kennedy, Alexander...Boston. 1075 Boylston St.
Gladstone
- 1905 Kennedy, Edward Anthony..Great Barrington.
314 Main St.
- 1901 Kennelly, Julia Grice....Cambridge. Kennedy Rd.
- 1913 Kenney, Clarence Bronson.State Farm (Bridgewater).
- 1884 Kenney, John Erle.....Chelsea. 119 Hawthorn St.
- 1909 Kenney, Thomas Francis...Worcester. 9 High St.
- 1905 Kenney, Walter Clement...Winchendon. 22 Walnut St.
- 1909 Kennison, Frederick...Holbrook.
Marshman 93 North Franklin St.
- 1907 Kent, Bradford.....Dorchester (Boston).
798 Blue Hill Av.
- 1905 Kent, Ralph Porter.....Attleborough.
27 South Main St.
- 1914 Kenworthy, Marion...Gardner. State Colony.
Edwena
- 1883 Kenyon, Henry Jesse....Worcester. 84 Pleasant St.
- 1900 Keyser, Charles Ober....Boston.
362 Commonwealth Av.
- 1904 Kerr, Isabella Dickieson...Boston. 821 Beacon St.
- 1915 Kerrigan, John Joseph....Fall River.
1427 North Main St.
- 1911 Kerrigan, Joseph Henry...Stoneham. 66 Cental St.
- 1909 Kickham, Charles Joseph..Brookline. Office, Boston.
483 Beacon St.
- 1908 Kilbourn, Arthur Goss....Groton. Main St.
- 1884 Kilburn, Henry Whitman...Boston. 192 Marlboro' St.
- 1913 Kilburn, Ira Nelson.....Holyoke. 180 Chestnut St.
- 1877 Kilby, Henry Sherman....North Attleborough.
98 Church St.
- 1914 Killam, Franklin...Medford. 326 Boston Av.
Harrison
- 1914 Killelea, Edward Vincent..Fitchburg. 5 Day St.
- 1890 Kilroy, Philip.....Springfield. 61 Chestnut St.
- 1905 Kimpton, Arthur Ronald...Boston. 86 Bay State Rd.
- 1909 King, Frederick Augustine.Boston. 357 Mass. Av.
- 1910 King, George Clifford....Fall River. 57 Rock St.
- 1914 King, George Elbert....Palmer.
Monson State Hospital.
- 1898 King, Myron Louls.....Cambridge. 788 Mass. Ave.
- 1888 King, Nathaniel Clark....Campello (Brookton).
1147 South Main St.
- 1910 King, Nicholas James...Roslindale (Boston).
49 Florence St.
- 1881 Kingman, Rufus Anderson..Brookline Office, Boston.
366 Commonwealth Av.
- 1875 Kingsbury, Albert Dexter..Needham.
#1913 291 Great Plain Av.
- 1906 Kingsbury, Walter Warren.Malden. 179 Ferry St.
- 1905 Kingsley, Patrick Joseph...Dorchester (Boston).
5 Adams St.
- 1904 Kinloch, Raymond...Springfield. 83 Walnut St.
Alexander
- 1914 Kinne, George Lyman....Holyoke. 285 Maple St.
- 1900 Kinney, William D'Arcy...Osterville (Barnstable).
- 1908 Kinnicut, Roger.....Worcester. 72 Cedar St.
- 1904 Kirby, Holder Crary.....New Bedford.
33 South Sixth St.
- 1904 Kirbr, James Richard....Clinton. 181 Chestnut St.
Lynn
- 1907 Kirkpatrick, George...Holland 192 South Common St.
- 1915 Kirkwood, Allan Stewart..Newton Center (Newton).
1301 Center St.
- 1910 Kissack, Robert James....Boston. 479 Beacon St.
- 1898 Kite, Walter Chester.....Milton. 17 Russell St.
- 1880 Kittredge, Joseph.....Brookline. 69 Cypress St.
- 1874 Kittredge, Thomas.....Salem. 13 Chestnut St.
- 1914 Kline, George Milton.....Hathorne (Danvers).
- 1881 Knapp, Philip Coombs....Boston. 635 Beacon St.

- 1899 Knight, Charles Eugene....Rockland. 29 Church St.
 1902 Knight, Charles Lewis....West Roxbury (Boston).
 Office, Boston
 544 Columbus Av.
 1902 Knight, Charles Sumner...Westborough.
 54 West Main St.
 1896 Knight, Marcus Whitney...Milford. 8 West St.
 1889 Knowles, James Harris....Gloucester.
 2½ Highland St.
 1884 Knowles, William Fletcher..West Newton. Office.
 Boston. 220 Clarendon St.
 1892 Knowlton, Charles Davison..Roxbury (Boston).
 574 Warren St.
 1910 Knowlton, Edward Allen...Holyoke. 227 Maple St.
 1903 Knowlton, Wallace Miles...Boston. 462 Boylston St.
 1901 Knowlton, William Thomas..Hubbardston. Barre Rd.
 1911 Knudson, Mette Marie.....West Roxbury (Boston).
 78 Park St.
 1903 Konikow-Bucholz, Malden. 103 Bryant St.
 Antoinette Frederica
 1894 Konikow, Moses Joseph....Roxbury (Boston).
 456 Warren St.
 1901 Kurth, Gustave Emil.....Lawrence.
 86 East Haverhill St.
- L**
- 1909 Lachance, Alfred Philias...Gardner. 142 Parker St.
 1900 Ladd, Maynard.....Boston. 270 Clarendon St.
 1907 Ladd, William Edwards...Boston. 42 Gloucester St.
 1906 Lahey, Francis Howard....Boston. 638 Beacon St.
 1899 Laighton, Florence Marion..New York, N. Y.
 33 West 96th St.
 1902 Lally, Francis Henry.....Milford. 5 Park Terr.
 1915 Lally, William James.....Pittsfield. 184 North St.
 1892 LaMarche, Walter Joseph...Cambridge. 1038 Mass. Av.
 1901 Lambert, Fred De Forest...Tyngsborough.
 1901 Lambert, John Henry.....Lowell. 202 Merrimack St.
 1912 LaMoure, Charles Ten Lakeville, Conn.
 Eyck Conn. School for Imbeciles.
 1894 Lamoureux, Joseph Elzear..Lowell. 710 Merrimack St.
 1892 Lancaster, Sherman Russell..Cambridge. 27 William St.
 1891 Lancaster, Walter Brookline. Office, Boston.
 Brackett 522 Commonwealth Av.
 1880 Lane, Albert Clarence....Woburn. 42 Pleasant St.
 1909 Lane, Clarence Guy.....Woburn. 36 Pleasant St.
 1914 Lane, Clayton Rogers.....Fitchburg.
 Burbank Hospital.
 1884 Lane, Edward Binney.....Jamaica Plain (Boston).
 Office, Boston.
 419 Boylston St.
 1894 Lane, Francis Augustus...East Lynn (Lynn).
 29 Lakeview Av.
 1905 Lane, John William.....Dorchester (Boston).
 Office, Boston.
 520 Beacon St.
 1900 Lane, Walter Appleton....Milton. 173 School St.
 1904 Lang, Herbert Bowman....South Hadley.
 1896 Langlois, Joseph Augustus..Pittsfield. 54 Bradford St.
 1908 Langnecker, Harry Leslie..Cambridge. Office, Boston.
 8 Marlboro' St.
 1907 Lanpher, Howard Arthur...Chester.
 1915 LaRiviere, Evariste Gerald..New Bedford.
 1394 Acushnet Av.
 1913 La Rochelle, Fred Désiré...Springfield. 508 Main St.
 1915 Larrabee, Frank Walton...Brighton (Boston).
 637 Washington St.
 1905 Larrabee, Herbert Manson..Tewksbury. Main St.
 1897 Larrabee, Ralph Clinton...Boston.
 520 Commonwealth Av.
 1911 Laskey, Edward Philip....Haverhill. 94 Emerson St.
 1899 Latham, Benoni Mowry....Mansfield.
 10 North Main St.
 1876 Lathrop, William Henry Lowel. 21 First St.
 1905
 1910 Laton, George Peavey....Salem, N. H. Main St.
 1898 Lavalée, George Omer.....Lowell. 790 Merrimack St.
 1872 LaVigne, Alfred Willis Lowel. 173 Merrimack St.
 1913
 1906 Law, Katharine Hayes....Erie, Pa. 247 West 5th St.
 1888 Lawler, William Patrick...Lowell. 53 Central St.
 1914 Lawley, Bruce Irving.....Arlington. 177 Mass. Av.
 1907 Lawlor, Edward Francis...Lawrence.
 94 Bennington St.
 1906 Lawlor, Richard Henry....Methuen. 251 Broadway.
 1911 Lawrence, Charles Brookline. Office, Boston.
 Henry, Jr. 522 Commonwealth Av.
 1896 Lawrence, James Wilmot..Malden. 25 Washington St.
 1897 Lawrence, Joseph Henry...Brockton. 23 Main St.
 1899 Lawrence, Nellie Louise...Louisville, Ky. 513 West St.
 1873 Lawrence, Robert Means Boston. 177 Bay State Rd.
 1912
 1915 Lawrey, Lawson Gentry....Hathorne (Danvers).
 State Hospital.
 1907 Laws, Sophie Goudge.....Spartanburg, S. C.
 Converse College.
 1894 Leach, Edward Mortimer...Rochdale (Leicester).
 1893 Leach, Horace Morton...Rochdale (Leicester).
 1892 Leahey, George Henry Lowell. 128 Merrimack St.
 Aloysius
 1895 Leard, John Samuel Hick..Jamaica Plain (Boston).
 392 Arborway.
 1887 Learned, William Turell...Fall River. 42 Franklin St.
 1892 Learoyd, Charles Berry....Taunton. 2 Vine St.
 1914 Leary, Alfred James.....Newton. Office, Boston.
 19 Bay State Rd.
 1905 Leary, Chrysostom John...New Bedford.
 415 Pleasant St.
 1901 Leary, Olga Cushing.....Jamaica Plain (Boston).
 44 Burroughs St.
 1913 Leary, Patrick Frank.....Turner's Falls (Montague).
 20 Prospect St.
 1906 Leary, Timothy.....Jamaica Plain (Boston).
 Office, Boston.
 416 Huntington Av.
 1897 Leary, William Charles...Springfield. 630 Main St.
 1914 Leavitt, Peirce Samuel....Boston. City Hospital.
 1865 Leavitt, William Whipple Pittsfield. 120 South St.
 1906
 1909 LeBeuf, Alfred Thomas...Salem. 319 Lafayette St.
 1910 Lee, Harry Jason.....Boston. 535 Beacon St.
 1907 Lee, Roger Irving.....Cambridge. 4 Weld Hall.
 1914 Lee, Wesley Terence.....Brookline. Office, Boston.
 220 Clarendon St.
 1901 Leen, Thomas Francis....Boston. 19 Bay State Rd.
 1912 Leeper, Marion Eleanor...Northampton. 33 Elm St.
 1900 Legg, Arthur Thornton....Boston. 535 Beacon St.
 1905 LeGro, Lester Burnside...Haverhill.
 50 Merrimack St.
 1911 Leland, Forrest LeRoy....South Hadley Falls (South Hadley). 44 Bardwell St.
 1877 Leland, George Adams....Boston.
 354 Commonwealth Av.
 1912 Leland, George Adams, Jr. Boston.
 354 Commonwealth Av.
 1903 Lemaire, Willard Wallace..Worcester.
 458 West Boylston St.
 1908 Lemaire, William Franklin..East Lynn (Lynn).
 134 Chestnut St.
 1913 Lemay, Alfred Mederic....Brockton. 7 Main St.
 1906 Lemieux, Theodule Alfred..Lawrence.
 356 Haverhill St.
 1913 Leonard, Ralph Davis....Melrose. Office, Boston.
 43 Bay State Rd.
 1915 Leonard, Zenas Lockwood..West Stockbridge.
 P. O., State Line, N. Y.
 1908 Leslie, Charles Thomas...Pittsfield. 86 North St.
 1900 Leslie, Herbert Granville..Amesbury. 273 Main St.
 1910 L'Esperance, Oscar Raoul Boston. 100 Boylston St.
 Talon
 1908 Lesses, Max.....Salem. 62 Washington Sq.
 1914 Levek, Joseph Arthur....Lawrence. 32 Lawrence St.
 1915 Levine, Samuel Albert....Roxbury (Boston).
 47 Wyoming St.
 1904 Levins, Nathan Noah....Boston. 30 Chambers St.
 1907 Levy, Felix Julius.....Brookline. 1469 Beacon St.
 1913 Lewandowski, Julia Mary..Holyoke. 97 High St.
 1894 Lewis, Arthur Cuthbert...Fall River.
 1018 North Main St.

- 1900 Lewis, Elisha Sears.....Princeton. Wachuset St.
1913 Lewis, Frank Edward.....Nantucket.
1906 Lewis, James Prince.....Waltham. Office, Boston.
543 Boylston St.
1914 Lewis, Seth Ames.....Springfield.
45 North Main St.
1897 Libby, Edward Norton.....Roxbury (Boston). Office,
Boston. 638 Beacon St.
1893 Libby, Jesse Herbert.....East Weymouth
(Weymouth).
1899 Libby, Mary Gordon.....Newport, N. H.
1903 Libby, Mildred Augusta.....Baldwinsville (Templeton).
1912 Lieberman, William.....Brookline. Office, Boston.
1063 Boylston St.
1915 Limauro, Louis Herbert.....Lynn. 17 Franklin St.
1912 Lincoln, George Chandler.....Worcester. 2 Linden St.
1889 Lincoln, Jacob Read.....Milbury.
1903 Lincoln Merrick.....Worcester. 2 Linden St.
1903 Lindquist, Carl Augustus.....Boston. 24 Westland Av.
1915 Lindsay, John Crandall.....Tewksbury.
State Infirmary.
1897 Lindsay, Joseph Ira.....Worcester. 7 Oberlin St.
1904 } Lindsey, John Hathaway. Fall River. 151 Rock St.
1914 }
1905 Linenthal, Harry.....Roxbury (Boston). Office,
Boston. 483 Beacon St.
1886 Linfield, Edward Porter.....Avon.
1884 Linfield, William Harvey.....Brookline. 1378 Beacon St.
1902 Lithgow, Robert Alexander Boston. 43 Chestnut St.
Douglas #1911
1895 Little, Abby Noyes.....Newburyport. 22 Essex St.
1904 Little, John Mason, Jr.....Boston. 317 Dartmouth St.
1884 Little, William Brimblecom.....Lynn. 13 Nahant St.
1898 } Littlefield, George Curtis. Webster.
1907 } 23 East Main St.
1909 Littlefield, Marion Curtis.....Bradford (Haverhill).
Office Haverhill.
50 Merrimack St.
1893 Littlefield, Samuel Horace.....Roxbury (Boston).
2 St. James St.
1909 Littlewood, Thomas.....Pittsfield. 79 Tyler St.
1900 Liverpool, Coval Henry.....West Somerville (Somerville).
325 Highland Av.
1900 Livingston, Clarence Lowell. 9 Central St.
Bertram
1900 Livingston, Ernest George.....Lowell.
10 East Merrimack St.
1906 Lloyd, Henry Demarest.....Boston. 657 Boylston St.
1898 Lockary, Joseph Logue.....Roxbury (Boston).
108 Warren St.
1903 Locke, Edwin Allen.....Boston. 311 Beacon St.
1889 Lockhart, Joseph Smith.....Cambridge. 837 Mass. Av.
1910 Loder, Halsey Beach.....Boston.
520 Commonwealth Av.
1903 Loewe, Leonard Joseph.....Haddam, Conn.
1897 Logan, Frank Barker Tays.....Gloucester. 42 Middle St.
1915 Look, Percy Jonathan.....Andover. 115 Main St.
1902 Lord, Frederick Taylor.....Boston. 305 Beacon St.
1896 Lord, Sidney Archer.....Cromwell, Conn.
Cromwell Hall.
1897 Loring, Robert Gardner.....Lincoln. Office, Boston.
10 Arlington St.
1876 Loring, Robert Pearmain.....Newton Center (Newton).
19 Crescent Av.
1890 Lothrop, Howard Augustus.....Boston. 101 Beacon St.
1909 Lothrop, Oliver Ames.....Boston. 101 Beacon St.
1895 Lougee, Frank Taylor.....Lynn. 11 Atlantic St.
1912 Lougee, George Woodworth.....Lynn. 57 Estes St.
1910 Lougee, John Leroy.....West Roxbury (Boston).
Office, Boston.
514 Commonwealth Av.
1899 Lougee, William Wheeler.....Malden. 195 Main St.
1897 Lovejoy, James Francis.....Lowell. 219 Central St.
1872 Loughran, Charles Averill.....Lynn. 64 Broad St.
1894 Lovell, Charles Dixon.....Lynn.
Smith 128 South Common St.
1885 Lovell, Charles Edward.....Whitman. South Av.
1894 Lovell, David Bigelow.....Worcester. 340 Main St.
1900 Lovell, Martha Eleanor.....Allston (Boston).
52 Ashford St.
1884 Lovett, Robert William.....Boston. 234 Marlboro' St.
1903 Lowd, Harry Mosher.....Swampscott.
1886 Lowe, Fred Messenger.....West Newton (Newton).
1354 Washington St.
1901 Lowell, Albert Fay.....Gardner. 20 Vernon St.
1898 Lowell, Alverne Percy.....Fitchburg. 52 Hartwell St.
1901 Lowell, Freeman.....Boston. 2A Milford St.
Lamprey
1905 Lowell, William Holbrook.....Winchester. Office, Boston.
101 Newbury St.
1906 Lowney, Dennis Joseph.....New Bedford.
1325 Acushnet Av.
1902 Lowney, John Francis.....Fall River.
755 Plymouth A.
1910 Lucas, William Palmer.....San Francisco, Calif.
University Hospital.
1908 Luce, Dean Sherwood.....Canton.
1913 Luce, LeRoy Alson.....Boston. 394 Marlboro' St.
1898 Luchtsinger, Harry Warner.....Housatonic (Great Barrington). Main St.
1913 Luftig, Jacob.....Dorchester (Boston).
Office, Boston.
282 Columbus Av.
1891 Lund, Fred Bates.....Boston. 527 Beacon St.
1908 Lundwall, Laurence Gardner. 316 Central St.
Svante Bernhard
1908 Lupien, Henry John.....Brockton. 63 Main St.
1890 Lussier, Charles Arthur.....Worcester. 154 Grand St.
1913 Lyle, Eveline Burton.....Brookline. 5 Winchester St.
1914 Lyman, Henry.....Boston.
36 Commonwealth Av.
1907 Lyman, William Robinson.....Worthington.
1899 Lynch, Charles Francis.....Springfield. 317 Main St.
1903 Lynch, Cornelius Joseph.....Quincy. 1620 Hancock St.
1908 Lynch, Daniel Lawrence.....Roslindale (Boston).
100 Belgrade Av.
1913 Lynch, Henry Edmund.....Holyoke. 240 Maple St.
1902 Lynch, Patrick Michael.....Springfield. 39 Main St.
1911 Lynch, William Francis.....Worcester. 20 Portland St.
1887 } Lyon, Arthur Vinal.....Brockton. 106 Main St.
1915 }
1914 Lyons, George Aloysius.....Lynn.
120 South Common St.
1896 Lyons, Joseph Benedict.....Charlestown (Boston).
1 Dexter Row.

M

1889 MacArthur, George Elden.....Ipswich. 45 Central St.
1913 MacAusland, Andrew Roy.....Boston. 240 Newbury St.
1905 MacAusland, William.....Boston. 240 Newbury St.
Russell
1913 Macauley, Joseph Arthur.....Dorchester (Boston).
561 Dudley St.
1907 MacCallum, Wallace Peter.....Boston.
214 Huntington Av.
1905 MacCormick, John Allan.....Boston. 1077 Boylston St.
1912 MacCorison, Carl.....North Reading. State
Sanatorium,
P. O. North Wilmington.
1896 Macdonald, Alexander.....Dorchester (Boston).
119 Washington St.
1887 Macdonald, Colin William.....Roxbury (Boston).
1 New Heath St.
1909 MacDonald, Donald.....Taunton. 10 White St.
Francis
1906 Macdonald, Frederick.....Roxbury (Boston).
622 Warren St.
1914 MacDonald, Frederick.....Waltham. Office, Boston.
Livingstone 419 Boylston St.
1913 Macdonald, John Bernard.....Hathorne (Danvers).
State Hospital.
1908 MacDonald, William.....Malden. 538 Main St.
Campbell
1885 Macdonald, William Lewis.....Wellesley Hills
(Wellesley).
1915 Macdougall, Duncan.....Haverhill. 131 Main St.
1908 Mace, Charles Herbert.....Huntington.
1913 MacFadyen, John.....Worcester. 118 Belmont St.
Alexander
1901 MacKay, Edward Hart.....Clinton. 92 Walnut St.

- 1898 MacKay, George Finlay...Dalton. 71 Main St.
 1879 MacKeen, Alfred Atwater...Whitman. 29 Park Av.
 1915 MacKenzie, Roland Chester Waltham. 111 Main St.
 1906 MacKerrow, Horace Gilford Worcester. 96 Eastern Av.
 1885 Mackie, Laura Viola Attleborough.
 Gustin 157 Pleasant St.
 1899 Mackie, William Charles...Brookline. 54 Coolidge St.
 1905 MacKillop, Daniel...Cambridge. 307 Broadway.
 1907 MacKinnon, Donald Medford. Office, Boston.
 Lauchlin 8 Columbus Sq.
 1914 MacKay, William Henry...Poughkeepsie, N. Y.
 Vassar Brothers Hospital.
 1898 MacKnight, Adam Fall River.
 Stephenson 355 North Main St.
 1914 MacKnight, William Frank Boston. 198 St. Botolph St.
 1901 MacLennon, Angus Daniel Boston. 654 Tremont St.
 1907 }
 1913 } MacLeod, John Malcolm...Quincy. 28 Federal St.
 1915 }
 1908 MacLeod, Norman Murray Newport, R. I.
 Newport Hospital.
 1911 MacMichael, Earle Haggett Malden. 66 Summer St.
 1890 MacMillan, Andrew Louis Hanover. Washington St.
 †1915
 1910 MacMillan, Andrew Concord, N. H.
 Louis, Jr. 28 South Main St.
 1910 MacNeil, Charles Seward Malden. 143 Main St.
 Jadis
 1912 Macomber, Donald...West Newton (Newton).
 41 Highland St.
 1892 } MacPherson, William } St. Marc, Haiti.
 1903 } Ellsworth }
 1904 Macrae, Annie Campbell...Fall River. 130 Rock St.
 1904 Madden, William Daniel Boston. 669 Mass. Av.
 1905 Magrath, George Burgess Boston. 274 Boylston St.
 1898 Maguire, Charles Francis Somerville. 432 Medford St.
 1906 Maguire, Eugene Leo Somerville. 390 Medford St.
 1908 Maguire, Frank Leroy Worcester. 765 Main St.
 1903 Magurn, Francis Thomas Charlestown (Boston).
 Louis 112 Main St.
 1913 Mahar, Harold Robert Orange. 1 High St.
 Collins
 1904 Mahoney, Daniel Francis Boston. 24 Marlboro' St.
 1898 Mahoney, Edward Joseph Springfield. 4 Mattoon St.
 1905 } Mahoney, Francis Xavier... }
 1915 } 701 Columbia Rd.
 1896 Mahoney, George Clifton...West Somerville (Somer-
 ville). 97 College Av.
 1911 Mahoney, Matthew Patrick Lowell. 169 Merrimack St.
 1888 Mahoney, Stephen Andrew Holyoke. 630 Dwight St.
 1913 Mahoney, Walter Francis Westborough. 39 South St.
 1902 Mahony, Francis Ronan...Lowell. 8 Merrimack Sq.
 1899 Mains, Charles Frederick Dorchester (Boston).
 1485 Dorchester Av.
 1915 Mains, Herbert Llewellyn Danvers. 71 Holton St.
 1905 Makechnie, Arthur North Cambridge. 14 Upland Rd.
 1879 Makechnie, Horace West Somerville (Somer-
 Perkins †1907 ville). 238 Elm St.
 1891 Mallory, Frank Burr...Brookline
 Office, Roxbury (Boston).
 240 Longwood Av.
 1903 Malone, Charles...Jamaica Plain (Boston).
 3 Glen Rd.
 1908 Maloney, John Martin...Springfield. 559 Liberty St.
 1893 Manahan, Herbert Lawrence.
 Wellington 104 South Broadway.
 1901 Mandell, Augustus Hamlin New Bedford.
 25 Sycamore St.
 1893 Mangan, John Joseph...Lynn.
 174 South Common St.
 1902 Manix, Edward Tuck...Lynn. 59 Lewis St.
 1908 Mannix, Louis Edward...Chicopee Falls (Chicopee).
 112 Main St.
 1915 Mansfield, Berleigh Burton Salem. 31 Charter St.
 1869 Mansfield, Henry Tucker Needham. 897 Highland Av.
 †1911
 1897 Mansfield, James Albert...Roxbury (Boston).
 342 Dudley St.
 1899 Mansur, Leon Wallace...Los Angeles, Calif.
 1109 Brockman Bldg.
 1911 Mara, Joseph Lawrence...Brockton. 616 Main St.
 1912 Marble, Henry Chase...Boston.
 28 Commonwealth Av.
 1870 Marble, John Oliver †1908 Worcester. 16 Murray Av.
 1903 Marcey, Walter John...Minneapolis, Minn.
 9th St. and Nicolet Av.
 1863 Marcy, Henry Orlando...Boston. Office, Cambridge.
 860 Mass. Av.
 1901 Marcy, Henry Orlando, Jr. Newton. 140 Sargent St.
 1903 Markham, Erwin Walter...Lee, Main St.
 1913 Maroney, Patrick Joseph...Westfield. 16 Chapel St.
 1913 Marr, Edward Loring...Melrose. 36 Whittier St.
 1895 Marr, Myron Lawrence...Dorchester (Boston).
 11 Hoepstill St.
 1907 Marr, Myron Whitmore...Dorchester (Boston).
 206 Minot St.
 1912 Marr, Robert McClellan...Westfield. 29 Elm St.
 1912 Marsden, George...New Bedford.
 1579 Acushnet Av.
 1915 Marsh, Albert...Reading. R. F. D.
 1910 Marsh, Anna Peabody...Danvers. 155 Center St.
 1895 Marsh, Arthur White...Worcester. 690 Main St.
 1903 Marshall, Augustus Chelsea, Vt.
 Thompson
 1909 Marshall, Herman Weston Brookline. Office, Boston.
 8 Marlboro' St.
 1908 Marshall, William Lynn. 26 Broad St.
 Reginald
 1911 Marston, Warren Winfield Newton.
 337 Washington St.
 1897 Martel, Stanislaus...Lynn. Office, Boston.
 362 Commonwealth Av.
 1897 Martin, Archibald Herbert Lynn. 29 Broad St.
 1913 Martin, Edward...Roxbury (Boston).
 217 Warren St.
 1913 Martin, Harold Winthrop Dorchester (Boston).
 2 Rockville Place.
 1898 Martin, Harry Charles...Springfield. 374 Main St.
 1904 Martin, John Brayton...Lynn. 25 Newhall St.
 1913 Martin, John Foley...Boston. 1 Mountfort St.
 1897 Martin, John Macleod...Roxbury (Boston).
 440 Warren St.
 1891 Martin, Miles...Boston.
 Hotel Westminster.
 Copley Sq.
 1902 Marvell, Mary Wilbur...Fall River.
 243 Highland Av.
 1884 Mason, Atherton Perry...Fitchburg. 353½ Main St.
 1914 Mason, Broadstreet Henry Worcester. State Hospital.
 1913 Mason, Gilbert McClellan Dorchester (Boston).
 Office, Boston.
 520 Beacon St.
 1902 Mason, Nathaniel Robert Boston. 483 Beacon St.
 1907 Masse, John Baptiste...Lawrence. 260 Broadway.
 1900 Masten, Charles Howard Worcester. 919 Main St.
 1876 Mather, Edward Elias †1910 Williamstown.
 1906 Mather, John Adams...Colrain. Box 49.
 1907 Mathes, Roy Wentworth Lynn. 32 Chestnut St.
 1910 Mathews, Robert Francis Worcester.
 18¼ Portland St.
 1915 Mathewson, Frank Weedon New Bedford. 250 Union St.
 1879 Matte, Joseph Hubert North Adams.
 Ambrose †1914 82 Church St.
 1909 May, George Elisha...Newton Center (Newton).
 661 Commonwealth Av.
 1899 May, John Shepard...Roxbury (Boston).
 495 Warren St.
 1889 Mayberry, Edwin Nelson South Weymouth.
 (Weymouth).
 1905 Mayberry, Frank Eugene Pittsfield. 100 North St.
 1902 Mayhew, Orland Smith Vineyard Haven (Tisbury).
 1896 McAdams, James Philip Lowell. 295 Central St.
 1910 McAdams, Peter Stephens Cambridge. Office, Boston.
 1075 Boylston St.
 1905 McAllester, Ralph William Everett. 693 Broadway.
 1899 McAllister, Frederick Lawrence. 31 Jackson St.
 Danforth
 1906 McArdle, John Joseph...Lawrence. 477 Essex St.
 1902 McRain, William Hearst Malden. 456 Pleasant St.
 1910 McCabe, Francis Joseph North Easton (Easton).
 59 Main St.
 1897 McCabe, John Joseph Holyoke. 290 Maple St.

- 1905 McCaffrey, Charles Francis. Somerville. 44 Summer St.
 1913 McCann, Charles Daniel. Brockton. 28 Main St.
 1886 McCarthy, Charles Daniel. Malden. 164 Pleasant St.
 1897 McCarthy, Charles Florence. Winchester. 452 Main St.
 1892 McCarthy, Eugene Allan. Cambridge. 5 Bigelow St.
 1908 McCarthy, Eugene Ambrose. Fall River. 901 Second St.
 1906 McCarthy, Francis Patrick. Mattapan (Boston).
 1420 Blue Hill Av.
 1907 McCarthy, Louis Florence. Malden. 311 Pleasant St.
 1897 McCarthy, Thomas Francis. Marlborough. Cotting Av.
 1890 McCarthy, Thomas. Brookline. 183 Main St.
 Horatio
 1906 McCarthy, Timothy. Jamaica, N. Y.
 Francis
 1878 McCarty, James Joseph. Lowell. 574 Central St.
 1904 McCausland, William. Quincy. 123 Franklin St.
 James
 1875 McClean, George Chesley. Springfield. 337 State St.
 1912 McClintock, Francis Blake. Chelsea. 27 Crescent Av.
 1911 McCluskey, Richard John. Lowell. 40 Middlesex St.
 1908 McClusky, Henry Lincoln. Worcester.
 7 Hawthorne St.
 1912 McConnell, David James. Greenfield. 2 Chapman St.
 1900 McCormick, Alfred Hugh. Northampton. 78 Main St.
 1875 McCormick, Cornelius. Waltham. 825 Main St.
 Joseph
 1906 McCormick, John Joseph. Woburn. 60 Montvale Av.
 1904 McCormick, Thomas. Roxbury (Boston).
 Joseph Henry
 1907 McCready, Leo Thomas. Jamaica Plain (Boston).
 2 Peter Parley Rd.
 1911 McCreery, Clarence. Fall River.
 Charles
 1906 McCurdy, Theodore. Roxbury (Boston).
 Edward Alexis
 1900 McDermott, Joseph. Charlestown (Boston).
 Edward
 1898 McDermott, William. Salem. 6 Brown St.
 Vincent
 1903 McDonald, James William. Worcester. 33 Trumbull St.
 1902 McDonald, Samuel James. Boston. 657 Boylston St.
 1899 McDonald, William Joseph. Charlestown (Boston).
 41 High St.
 1900 McEvoy, George Albert. Dorchester (Boston).
 Office, Boston.
 520 Beacon St.
 1894 McEvoy, Thomas Edward. Worcester. 37 Portland St.
 1898 McFee, William David. Haverhill.
 103 Merrimack St.
 1914 McGann, Pierce Powers. Somerville.
 140 Highland Av.
 1886 McGannon, Thomas Gerald. Lowell. 226 Merrimack St.
 1891 McGauran, Michael. Lawrence. 258 Broadway.
 Sheridan
 1900 McGee, Fanny Maria. Waban (Newton).
 765 Chestnut St.
 1893 McGillicuddy, John. Worcester. 390 Main St.
 Timothy
 1904 McGillicuddy, Richard. Turner's Falls (Montague). Avenue A.
 Aloysius
 1914 McGinity, Joseph Taney. Springfield.
 236 Dickinson St.
 1909 McGinley, Michael Charles. Ipswich. Central St.
 1900 McGirr, Felix Francis. Cambridge.
 1436 Cambridge St.
 1898 McGrath, Bernard Francis. Rochester, Minn.
 St. Mary's Hospital.
 1912 McGraw, Andrew James. Taunton. 61 Broadway.
 1907 McGurn, William J. Roxbury (Boston).
 1165 Tremont St.
 1886 McIntire, David. Dorchester (Boston).
 246 Boston St.
 1914 McIntire, Frederic Joseph. Lynn.
 63 North Common St.
 1908 McIntire, George Francis. Cambridge. 5 Dana St.
 1882 McIntire, Herbert Bruce. Cambridge. 4 Garden St.
 1896 McIntosh, Herbert. Sharon. Office, Boston.
 419 Boylston St.
 1915 McIntosh, Jennie Grace. Worcester. State Hospital.
 1914 McIver, George Albert. Worcester. State Hospital.
 1900 McKallagat, Peter Leo. Lawrence. 301 Essex St.
 1915 McKechnie, Frederick. Springfield. 317 Main St.
 Joseph
 1897 McKeen, Sylvester Forshay. Allston (Boston).
 550 Cambridge St.
 1912 McKelvey, Alexander. Toronto, Canada.
 Dunbar
 1912 McKenna, Francis Patrick. Jamaica Plain (Boston).
 193 Bloor St., East.
 382 Center St.
 1893 } McKenzie, John Robert. Cambridge. 897 Mass. Av.
 1912 }
 1901 } McKibben, William Watson. Worcester. 390 Main St.
 1893 }
 1913 } McKeon, John William. Worcester. 53 Lincoln St.
 1914 McLaughlin, Allen Joseph. Boston. 145 State House.
 1914 McLaughlin, Arthur Otis. Haverhill. 120 Emerson St.
 1895 McLaughlin, Henry. Brookline. Office, Boston.
 Valentine
 394 Marlboro' St.
 1885 McLaughlin, Joseph. Roxbury (Boston).
 Ignatius
 92 Walnut Av.
 1910 McLean, John Allan. West Somerville (Somerville). 16 Curtis St.
 1915 McLellan, William Edwin. Lynn. 559 Western Av.
 1901 McLeod, John Scott. Roxbury (Boston).
 151 Warren St.
 1913 McMahon, Francis Joseph. Brookline.
 370 Washington St.
 1904 McMann, William Henry. Jamaica Plain (Boston).
 328 Center St.
 1900 McMurray, Francis Michael. Fitchburg. 267 Main St.
 1888 McNally, William Joseph. Charlestown (Boston).
 31 Monument Sq.
 1903 McNamara, John James. Brockton. 231 Main St.
 1898 McNeish, Alexander. Leicester. Pleasant St.
 1882 McOwen, William Henry. Newton Upper Falls (Newton). 280 Elliot St.
 1905 McPherson, George Edwin. Foxborough. Baker St.
 1903 McPherson, Ross. New York, N. Y.
 20 West 50th St.
 1909 McQuade, Lewis Steele. Dorchester (Boston).
 1081 Blue Hill Av.
 1898 McQuaid, Thomas Bernard. Everett. 487 Broadway.
 1910 McRae, Alexander John. Wilkes-Barre, Pa.
 City Hospital.
 1914 McRobbie, Alexander. Lynn. 48 So. Common St.
 1905 McSheehy, Theobald. Worcester. 86 Vernon St.
 Coleman
 1914 McWeeny, Bernadette. Boston. 15 Blagdon St.
 Marie
 1897 Mead, Frederick Ammi. Willimansett (Chicopee).
 984 Chicopee St.
 1892 Mead, George Nathaniel. Winchester. 27 Church St.
 Plummer
 1903 Mead, Louis Guy. Boston. 259 Beacon St.
 1912 Means, James Howard. Boston. 15 Chestnut St.
 1906 Means, Philip Corydon. Apponaug, R. I.
 1905 Medalia, Leon Samuel. Boston. 438 Beacon St.
 1905 Meehan, Patrick Joseph. Lowell. 228 Worthen St.
 1906 Mehan, Joseph Aloysius. Lowell. 4 Park St.
 1890 Meigs, Joe Vincent. Lowell. 160 Merrimack St.
 1894 Meigs, Return Jonathan. Lowell. 226 Merrimack St.
 1906 Mellen, Eleanor Way Allen. Newton Highlands (Newton). 291 Lake Av.
 1911 Mellen, Harry George. Pittsfield. 150 North St.
 1905 Mellus, Edward. Newton. 419 Waverley Av.
 1905 Mendelsohn, Louis. Dorchester (Boston).
 477 Washington St.
 1894 Mercer, William James. Pittsfield. 142 First St.
 1899 Merriam, Franklin Henry. South Braintree (Braintree). 37 Holbrook Av.
 1893 Merrick, Robert Michael. Dorchester (Boston).
 18 Mt. Ida Road.
 1914 Merrill, Adelbert Samuel. Somerville. 139 College Av.
 1896 Merrill, Arthur Ellsworth. Somerville. 367 Medford St.
 1905 Merrill, Ayres Philip. Pittsfield. 519 North St.
 1915 Merrill, Everett Albert. Lynn. 212 Boston St.
 1896 Merrill, William Howe. Lawrence. 301 Essex St.
 1901 Merritt, Louis Arthur. Wollaston (Quincy).
 357 Newport Av.
 1897 Merritt, Silas Virgil. Fall River. 297 Osborn St.

- 1900 Merritt, Victor Sulviro....Springfield.
141 Wilbraham Road.
- 1915 Meserve, Edwin Alonzo....Watertown.
236 Belmont St.
- 1883 Messer, Charles Carson....Turners' Falls (Montague).
Avenue A.
- 1910 Messer, Edward Raymond.Pittsfield. 344 North St.
- 1905 Messinger, Harry Carleton.Providence, R. I.
260 Broad St.
- 1896 Metcalf, Ben Hicks.....Winthrop.
174 Winthrop St.
- 1913 Metcalf, Julia Tracy.....Brookline. 16 Browne St.
- 1914 Metcalf, Richard.....Boston. 24 McLean St.
- 1912 Metzger, Butler.....Lynn. 153 Lewis St.
- 1914 Meyer, Edward James.....Somerville. 18 Bow St.
- 1901 Middleton, Willis Johnson.Quincy. 446 Washington St.
- 1885 Mignault, Rodrigue.....Lowell. 534 Merrimack St.
- 1909 Miles, Charles Gardner.....Brookton. 23 Main St.
- 1893 Miles, George Albert.....West Somerville (Somerville). 56 Chester St.
- 1867 Millard, Henry James North Adams.
81 Church St.
- 1892 Miller, Charles Herman.....Dorchester (Boston).
The Peabody, Ashmont St.
- 1877 Miller, Ernest Parker.....Fitchburg. 408 Main St.
- 1910 Miller, George Fremont.....Boston. 660 Tremont St.
- 1895 Miller, Lester Colwell.....Worcester. 14 Oxford St.
- 1909 Miller, Percy Farrington.....Harwich. Main St.
- 1912 Miller, Richard Henry.....Boston. 279 Clarendon St.
- 1900 Milot, Samuel Osgood.....Three Rivers (Palmer).
- 1880 Millet, Charles Summer.....Brookton. 23 Main St.
- 1915 Millet, George Edward Roxbury (Boston).
Parsons P. B. Brigham Hospital.
- 1913 Millett, Frank Albertus.....Greenfield. 17½ Federal St.
- 1898 Milliken, Charles Warren.....Barnstable.
- 1915 Mills, Alfred Ewing.....Somerville. 192 Central St.
- 1915 Mills, Charles Fisher.....Framingham. 62 Lincoln St.
- 1893 Milot, Alphonse Francois.....Taunton. 160 Bay St.
- 1900 Milot, Wilfrid Francois.....Attleborough. 27 Bank St.
- 1912 Mindlin, Carl.....Haverhill.
- 1915 Miner, Leroy Matthew 343 Washington St.
Newtonville (Newton).
Simpson Office, Boston.
- 1891 Miner, Worthington Ware. 37 Main St.
Warner
- 1912 Minot, George Richards.....Boston. 188 Marlboro' St.
- 1877 Minot, James Jackson.....Boston. 188 Marlboro' St.
- 1896 Minshall, Arthur Gladstone Northampton. 16 Center St.
Medfield.
- 1893 Mitchell, Arthur.....Warren, Pa. State Hosp.
- 1897 Mitchell, Harry Walter.....Needham Highlands
- 1901 Mitchell, William.....Needham (Needham).
- 1908 Mixter, Charles Galloupe.....Boston. 180 Marlboro' St.
- 1881 Mixter, Samuel Jason.....Boston. 180 Marlboro' St.
- 1907 Mixter, William James.....Boston. 180 Marlboro' St.
- 1909 Moeckel, Carl Richard.....Lawrence. 443 Broadway.
- 1904 Moline, Charles.....Sunderland.
- 1911 Monahan, Edward James.....Revere. 665 Beach St.
- 1914 Monahan, John Ambrose.....Clinton. 181 Chestnut St.
- 1913 Moncrieff, William New Bedford.
Armitage 142 Merrimack St.
- 1894 Mongan, Charles Edward.....Somerville. 24 Central St.
- 1880 Monks, George Howard.....Boston. 67 Marlboro' St.
- 1907 Monty, Adelbert Howard.....Brooklyn, N. Y.
Norwegian Hospital.
- 1898 } Moody, Flora Frost.... { Springfield.
- 1911 } 77 Dartmouth St.
- 1911 Moore, Frederick Porter.....Foxborough. State Hosp.
- 1911 Moore, George Albert.....Brookton. 47 Green St.
- 1904 } Moore, George Colton.....Boston. 16 Union Park.
- 1914 } 272 Newbury St.
- 1913 Moore, Howard.....Newton. Office, Boston.
- 1908 } Moore, John Francis.... Worcester. 11 Elm St.
- 1915 } 419 Boylston St.
- 1898 Moore, John Henry.....Boston. 419 Boylston St.
- 1914 Moore, Mary Teresa Roxbury (Boston).
Veronica Office, Boston.
- 1901 Moore, Philip Patrick.....Gloucester. 58 Middle St.
- 1903 Mooring, Scott Webber.....Gloucester.
738 Washington St.
- 1907 Moran, Charles Leo.....U. S. Navy.
- 1872 Moran, John Brennan Roxbury (Boston).
1908 35 Mt. Pleasant Av.
- 1911 Morgan, Charles Russell.....Boston. 1091 Boylston Av.
- 1885 Morgan, John.....Boston. 39 Huntington Av.
- 1903 Morgner, Richard August.....Fitchburg. 429 Main St.
- 1914 Moriarty, Patrick Maurice.Springfield. 820 State St.
- 1878 Morong, Arthur Bennett.....Boston. 12 Blackwood St.
- 1891 Morris, George Patrick.....South Boston (Boston).
811 Broadway.
- 1891 Morris, James Stewart.....Revere. 648 Beach St.
- 1889 Morris, John Gavin.....South Boston (Boston).
97 Broadway.
- 1873 Morris, Michael Augustine..Charlestown (Boston).
Office, Boston.
- 1897 Morris, Richard Hoit.....Everett. 39 Corey St.
- 1907 Morrison, Archibald Roxbury (Boston).
Benjamin 547 Blue Hill Av.
- 1910 Morrison, Hyman.....Dorchester (Boston).
103 Glenway St.
- 1908 Morrison, Robert Francis..Holyoke. 32 Main St.
- 1887 Morrison, William East Boston (Boston).
Alexander 80 Princeton St.
- 1913 Morrison, William Reid....East Boston (Boston).
80 Princeton St.
- 1892 Morrow, Charles Harvey..Gloucester. 46 Pleasant St.
- 1906 Morrow, William Robert..Framingham. 21 Irving St.
- 1898 Morse, Almon Gardner.....Hingham. Office, Boston.
421 Marlboro' St.
- 1892 Morse, Charles Ellsworth..Wareham. Main St.
- 1896 } Morse, Charles Frederick U. S. Army.
- 1914 } 11 Lincoln St.
- 1887 Morse, Frank Adelbert.....Lynn. 11 Lincoln St.
- 1896 Morse, Frank Leander.....Somerville.
78 Highland Av.
- 1885 Morse, Fred Harris.....Winthrop. Office, Boston.
462 Boylston St.
- 1910 Morse, George W.....Boston. 30 Pinckney St.
- 1878 Morse, Henry Lee.....Boston. 112 Marlboro' St.
- 1910 Morse, Irene May.....Clinton. 124 Water St.
- 1890 Morse, John Lovett.....Boston. 70 Bay State Rd.
- 1905 } Morse, Nathaniel Niles. { Office, Boston.
- 1914 } 69 Newbury St.
- 1909 Morse, Roy Sydney.....Ashland.
- 1908 Mosher, Harris Peyton.....Boston. 828 Beacon St.
- 1914 Mosher, Marshall James.....Waltham. 925 Main St.
- 1914 Mossman, George.....Fitchburg. Burbank Hosp.
- 1915 Mott, George Ernest.....Worcester. State Hospital.
- 1909 Mudge, Otis Pope.....Amesbury. 16 Market St.
- 1913 Mulcahy, William Edward.Springfield.
247 Eastern Av.
- 1908 Mullen, Peter James.....Amesbury.
12 Sparhawk St.
- 1884 Munro, Walter Lee.....Providence, R. I.
62 North Main St.
- 1906 Munroe, Harrington Lynn. 875 Western Av.
- 1901 Murdock, Frederick Bennett
Brockton. 54 West Elm St.
- 1908 Murphy, Anna Frances....Worcester. 5 King St.
- 1903 Murphy, Daniel David.....Amesbury. 164 Main St.
- 1915 Murphy, Daniel Francis...Beverly Farms (Beverly).
28 Vine St.
- 1914 Murphy, Edward Roxbury (Boston).
Frederick 1451 Tremont St.
- 1904 Murphy, Edward Martin...Lowell. 175 Central St.
- 1900 Murphy, Edward Vincent..Newport. R. I. 118 Mill St.
- 1895 Murphy, Emily Frances....Taunton. 23 Summer St.
- 1884 Murphy, Francis Charles..Boston. 315 Marlboro. St.
- 1904 Murphy, Frank Augustine..Taunton. 4 Fruit St.
- 1902 Murphy, Fred Towlsley....St. Louis, Mo.
1806 Locust St.
- 1905 Murphy, Frederick Paul...Lowell. 219 Central St.
- 1905 Murphy, Frederick Vincent..Attleborough. 51 Bank St.
- 1913 Murphy, John Joseph.....Cambridge. 3 Norris St.
- 1910 Murphy, John Patrick Washington, D. C.
Henry Govt. Hosp. for Insane.
- 1882 Murphy, Joseph Briggs....Taunton. 23 Summer St.

1913 Murphy, Joseph Leroy....Taunton. 23 Summer St.
 1905 Murphy, Thomas William...Lawrence. 248 Broadway.
 1898 Murphy, Timothy Joseph...Roxbury (Boston). Office.
 Boston. 520 Beacon St.
 1910 Murray, Benjamin Frank...Boston. 6 Beacon St.
 1910 Murray, Patrick Joseph....Dorchester (Boston).
 162 Harvard St.
 1907 Myers, Elizabeth Young...Springfield.
 11 St. James Av.
 1903 Myers, Samuel William....Boston. 34 McLean St.
 1903 Myers, Solomon.....East Boston (Boston).
 93 Lexington St.
 1904 Myles, Leo Thomas.....Cambridge. 146 Oxford St.
 1910 Myrick, Alfred Winthrop...Randolph.
 1901 Myrick, Hannah Glidden...Roxbury (Boston). Office.
 Boston. 502 Beacon St.
 1909 Mysel, Hymen Abraham...Haverhill.
 310 Washington St.
 1913 Mysel, Philip.....Roxbury (Boston).
 385 Warren St.

N

1905 Nagle, Evelyn Wyman....Boston. 550 Newbury St.
 1899 Nason, Arthur Clark....Newburyport. 178 High St.
 1895 Nason, Osman Cleander...Cambridge. 5 Chester St.
 Baker
 1914 Nathanson, Elias Saul....Lynn. 242 Summer St.
 1910 Naurison, James Zuslofsky. Springfield.
 25 North Main St.
 1908 Neff, Irwin Hoffman....Foxborough. State Hosp.
 1903 Nelligan, John Patrick....Cambridge.
 2336 Mass. Av.
 1912 Nelson, Christian Augustus. Cambridge. 1010 Mass. Av.
 1908 Nettle, Paul.....Haverhill.
 207 Groveland St.
 1907 Nevers, Harry Hill.....Lawrence.
 204 South Union St.
 1912 Newburgh, Louis Harry...Roxbury (Boston). Office.
 Boston. 419 Beacon St.
 1897 Newell, Franklin Spilman. Boston. 443 Beacon St.
 1901 Newhall, Avery Lester....Lynn. 7 Vine St.
 1909 Newhall, Harvey Field....Lynn. 51 Nahant St.
 1886 Newhall, Herbert William. Lynn. 82 Broad St.
 1886 Newhall, Lawrence...Brookfield.
 Thompson
 1899 Newton, Aaron Lewis....Northfield.
 1914 Newton, Edward Roswell...Somerville. 50 Benton Rd.
 1908 Newton, Ralph Waldo....U. S. Army.
 1909 Newton, Roland Stephen...Westborough.
 50 West Main St.
 1898 Newton, William Curtis...Revere. 596 Beach St.
 1870 Nichols, Arthur Howard...Boston. 55 Mt. Vernon St.
 †1911
 1890 Nichols, Edward Hall....Boston. 294 Marlboro' St.
 1892 Nichols, John Holyoke....Tewksbury.
 State Infirmary.
 1884 Nickerson, George...Stoneham. 55 Central St.
 Wheaton
 1902 Nickerson, John Peter....West Harwich (Harwich).
 1871 Nickerson, William Jabez...New Bedford.
 †1910 164 Middle St.
 1911 Nield, William Andrew....New Bedford. 62 Fifth St.
 1899 Nielsen, Edwin Björne...West Newton (Newton).
 Office, Boston.
 543 Boylston St.
 1912 Nietsch, Walter Eric...New Bedford.
 Lothar St. Luke's Hospital.
 1900 Nightingale, James....Worcester. 138 Franklin St.
 1915 Nigro, Michele.....Chelsea. Frost Hospital.
 1915 Niles, Edward Harry....Danvers. 66 Elm St.
 1874 Nims, Edward Beecher...Springfield. 40 Harvard St.
 †1903
 1914 Nishan, Hampartsumian...Boston.
 Miguerditch 1747 Washington St.
 1887 Noble, Alfred Ira.....Kalamazoo. Mch. Box A.
 1895 Noble, Annagente Fowler. Westfield. 21 Noble St.
 1915 Noble, Emory Corser....Mattapan (Boston).
 State Hospital.
 1906 Noble, Mary Gill.....Mattapan (Boston).
 State Hospital.

1902 Nolen, Walter Freeman....Boston. 535 Beacon St.
 1911 Noonan, William Andrew...Cambridge.
 472 Cambridge St.
 1914 Normand, Jean Napoleon...Fall River. 183 Hunter St.
 1865 Norris, Albert Lane...Malden. 283 Clifton St.
 †1907
 1903 Norris, Albert Perley....Cambridge. 760 Mass. Av.
 1886 Norton, Eben Carver....Norwood.
 792 Washington St.
 1903 Norton, George Edward...Cambridge. 102 Ivler St.
 1900 Norton, George Paul....Fitchburg. 24 Prichard St.
 1910 Norton, Herbert Rozelle...Dorchester (Boston).
 11 Bloomfield St.
 1881 Noyes, Ernest Henry....Newburyport. 12 Essex St.
 1908 Noyes, John Russell....Brockton. 63 Main St.
 1905 Noyes, Margaret Louise...Boston. 103 St. James Av.
 1890 Noyes, Nathaniel Kingsbury Duxbury. Washington St.
 1905 Noyes, William Nelson....Salem. 12 Pleasant St.
 1914 Nute, Albert James.....Boston. U. S. Immigration
 Station.
 1898 Nute, Marion.....Dorchester (Boston).
 461 Washington St.
 1903 Nye, Harry Royal.....Leominster. 27 Cotton St.

O

1901 Ober, Frank Roberts.....Roxbury (Boston).
 300 Longwood Av.
 1904 Ober, Ralph Beverley....Springfield. 76 Maple St.
 1912 O'Brien, Carl Robert....Bangor, Me. 6 State St.
 1903 O'Brien, Charles Thomas..Woburn. 11 Pleasant St.
 1905 O'Brien, Daniel Paul....New Bedford.
 330 Union St.
 1912 O'Brien, Edward Joseph...East Boston (Boston).
 Office, Boston.
 543 Boylston St.
 1911 O'Brien, Frederick...Brockton. 12 Cottage St.
 William
 1903 O'Brien, John Francis....Charlestown (Boston).
 Office, Boston.
 520 Beacon St.
 1911 O'Brien, John Francis....Fall River. Union Hosp.
 1911 O'Brien, John Francis....Taunton. State Hospital.
 1905 O'Brien, Joseph Jeremiah..Dorchester (Boston).
 2175 Dorchester Av.
 1900 O'Brien, Thomas James...Roxbury (Boston). Office.
 Boston. 483 Beacon St.
 1902 O'Brien, Walter John Leo. Jamaica Plain (Boston).
 218 South St.
 1885 O'Callaghan, Mary Vincent Worcester. 137 Pleasant St.
 1905 O'Connell, Andrew Edward Worcester. 390 Main St.
 1902 O'Connor, Dennis Francis..Worcester. 340 Main St.
 1893 O'Connor, James Bernard..Lowell. 188 Moore St.
 1901 O'Connor, John Francis...Worcester. 25 Portland St.
 1896 O'Connor, John Henry....Hyde Park (Boston).
 26 Oak St.
 1910 } O'Connor, Joseph William Worcester. 772 Main St.
 1915 }
 1911 O'Connor, Patrick Henry...New Bedford.
 240 County St.
 1907 O'Connor, Thomas Hugh...Roxbury (Boston).
 1466 Fremont St.
 1903 O'Day, George Frederick...Worcester. 10 Vernon St.
 1881 O'Donnell, Francis Michael. Newton.
 619 Washington St.
 1912 O'Donnell, George Thomas. Waltham. 768 Main St.
 1914 Oeser, Paul Richard.....Lawrence. 272 Jackson St.
 1892 Ogden, Jay Bergen.....New York, N. Y.
 1 Madison Av.
 1913 O'Hare, James Patrick....Dorchester (Boston).
 1775 Dorchester Av.
 1908 O'Keefe, Abbie Mabel....Roxbury (Boston). Office.
 Boston. 541 Boylston St.
 1899 O'Keefe, Daniel Thomas...Jamaica Plain (Boston).
 25 Glen Road.
 1914 O'Keefe, Edward Scott....Lynn. 164 Essex St.
 1893 O'Keefe, Michael Wallace...East Boston (Boston).
 30 Princeton St.
 1907 O'Leary, Joseph Augustus..Wakefield. 16 Chestnut St.
 1895 Olin, Francis Henry.....Southbridge. Hamilton St.

- 1889 Peirson, Edward Lawrence. Salem. 13 Barton Sq.
 1908 Pelletier, Alfred George. Winchendon. 261 Central St.
 1913 Pemberton, Frank Arthur. Boston. 175 Dartmouth St.
 1906 Penhallow, Dunlap Pearce. Boston. 46 Gloucester St.
 1903 Penny, Herbert Thomas. Cliftondale (Saugus). 25 Jackson St.
 1911 Penny, Mary McDermott. Cliftondale (Saugus). 26 Jackson St.
 1914 Percy, Karlton Goodsell. Boston. 259 Beacon St.
 1914 Perkins, Franklin Haskins. Wrentham. State School.
 1907 Perkins, Harry Bradford. Haverhill. 325 Washington St.
 1914 Perkins, Roy Stanley. Lowell. 329 Westford St.
 1907 Perkins, Thomas Tounge. Cliftondale (Saugus). 315 Lincoln Av.
 1898 Perley, Roscoe Damon. Melrose. 63 West Emerson St.
 1913 Perras, Louis Adéard. New Bedford. 129 Ruth St.
 1885 Perry, Arthur Pedro. Jamaica Plain (Boston). Office, Boston.
 1911 Perry, Charles Eugene. Haydenville (Williamshamshire Co. Sanatorium). 419 Boylston St.
 1883 } Perry, George Lewis. Athol. 304 Main St.
 1891 }
 1913 Perry, Harold Edgar. New Bedford. St. Luke's Hospital.
 1896 Perry, Henry Joseph. Boston. 636 Beacon St.
 1891 Perry, Herbert Brainard. Northampton. 187 Main St.
 1885 Perry, Martha. 1913 Taunton. 68 Broadway.
 1908 Perry, Sherman. Tewksbury. State Infirmary.
 1913 Peter, Alphonse Joseph. Newburyport. 68 Middle St.
 1892 Peterson, Charles. New Bedford. 90 Hillman St.
 1913 Peterson, Hugo Oliver. Worcester. 4 Pleasant St.
 1901 Peterson, John Adna. Hingham.
 1909 Petty, John Anderson. Brockton. 63 Main St.
 1914 Pettingill, Olin Sewall. Wallum Lake, R. I. State Sanatorium.
 1913 Phaneuf, Louis Eusébe. Boston. 514 Commonwealth Av.
 1912 Phelan, Edward Francis. North Brookfield.
 1892 Phelps, John Samuel. Boston. 76 Commonwealth Av.
 1907 Phelps, Olney Draper. Worcester. 452 Main St.
 1892 Phelps, Olney Windsor. Warren. Maple St.
 1910 Philbrick, Roscoe Hunter. East Northfield (Northfield).
 1901 } Phillips, Charles Henry. Beverly. 376 Cabot St.
 1915 }
 1907 Phillips, Wilson Frank. Dorchester (Boston). 3 Whitman St.
 1887 Phippen, Hardy. Salem. 84 Washington Sq.
 1904 Phippen, Walter Gray. Salem. 31 Chestnut St.
 1910 Phipps, Cadis. Boston. 536 Commonwealth Av.
 1880 Phipps, Walter Andros. Address unknown.
 1896 Pickard, Isaiah Lovell. Concord Junction (Concord).
 1895 Pierce, Appleton Howe. Leominster. 100 West St.
 1887 Pierce, Frank Benneville. Haverhill. 132 Main St.
 1898 Pierce, George Burgess. Milton. Office, Boston.
 1882 Pierce, Matthew Vassar. Milton. Canton Av.
 1886 } Pierce, Willard Henry. Bernardston. Office, Greenfield. 191 Main St.
 1909 }
 1908 Pierce-Higgins, Eudora. Taunton. 175 High St.
 1914 Pierson, Philip Hale. San Francisco, Calif. 1721 Pacific St.
 1886 Pigeon, James Cogswell. Roxbury (Boston). Du Maresque 27 Elm Hill Av.
 1905 Pike, Forrest Fay. Melrose. 67 Wyoming Av.
 1892 Pike, Forrest Wiley. Portsmouth, N. H. 4 Pleasant St.
 1901 } Pike, Winfred Carle. Boston. 82 Huntington Av.
 1906 }
 1900 Pillsbury, Boyden Harlin. Lowell. 8 Merrimack St.
 1897 Pillsbury, Ernest Dean. West Somerville (Somerville). 8 Curtis St.
 1909 Pillsbury, Fitzroy. Lowell. 9 Central St.
 Farnsworth
 1870 Pillsbury, George Harlin. Lowell. 58 Central St.
 1874 Pillsbury, Warren Wilbur. Newburyport. 1915 63 Washington St.
 1869 Pinkham, Joseph Gurney. Lynn. 64 Nahant St.
 1895 Piper, Frank. Boston. 39 Hancock St.
 1910 Piper, Fred Smith. Lexington. 462 Mass. Av.
 1885 Pitcher, Herbert Frank. Haverhill. 50 Merrimack St.
 1912 Pitcher, Hervey Brackett. Leominster. 82 Main St.
 1901 Pitta, Joao Carlos da Silva. New Bedford. 57 Allen St.
 1907 Place, Edwin Hemphill. Boston. 745 Mass. Av.
 1899 Place, Ralph Waldo. Somerville. 165 Medford St.
 1907 Playse, Linn Foss. Hopkinton. 14 Church St.
 1879 Plimpton, Lewis Henry. Norwood. Walpole St.
 1890 Plummer, Edward. Charlestown (Boston). Maverick Office, Boston.
 1897 Plummer, Frank Joseph. Malden. 162 Ferry St.
 1898 Plummer, Frank. Malden. 340 Pleasant St.
 Wentworth
 1906 Plunkett, Harold Brabazon. Lowell. 9 Central St.
 1907 Pofcher, Elias Harry. Worcester. 98 Winter St.
 1887 Poirier, Emile. Salem. 7 Harbor St.
 1915 Poirier, George Henri. Boston. 394 Marlboro' St.
 1903 Poirier, Horace. Salem. 173 Lafayette St.
 1886 Pomeroy, Hiram Sterling. Boston. 543 Boylston St.
 1902 Pond, Bernard Wesley. Boston. 180 Huntington Av.
 1908 Pond, Lucius Beverly. Easthampton. 113 Main St.
 1909 Poole, Laurence Earl. Gardner. 63 Parker St.
 1886 Pope, Emily Frances. Boston. 163 Newbury St.
 1887 Pope, Frank Fletcher. Ashby.
 1911 Popoff, Constantine. Haverhill. 158 Main St.
 1892 Porter, Charles Allen. Boston. 254 Beacon St.
 1873 } Porter, Frank Edward. Auburndale (Newton). 409 Auburn St.
 1877 }
 1903 Porter, Robert Brastow. North Easton (Easton). 4 Day St.
 1870 Post, Abner. Boston. 16 Newbury St.
 1904 Pote, Leonard Holden. West Somerville (Somerville). 334 Broadway.
 1889 Pothier, Joseph Charles. New Bedford. 247 Fourth St.
 1901 Potter, Alexander Carleton. Cambridge. Office Boston. 522 Commonwealth Av.
 1896 Potter, Frances Wason. Framingham. 11 Lexington Av.
 1907 Potter, John Claude. Framingham. 53 Concord St.
 1899 Potter, Lester Forest. New Bedford. 278 Union St.
 1898 Potts, Joseph Henry. Holyoke. 143 Chestnut St.
 1908 Powell, Maud Agatha. Lacomia N. H.
 1912 Power, George Aloysius. Worcester. 7 Vernon St.
 1909 Powers, Edward Parnell. Roxbury (Boston). 1615 Tremont St.
 1905 Powers, George Herman. Boston. 298 Marlboro' St.
 1905 Powers, Herbert Hale. Brookline. 68 Davis Av.
 1911 Powers, John Thomas. Chicopee Falls (Chicopee). 37 East St.
 1910 Praino, Gaetano. Boston. 39 Broadway Extension.
 1868 Pratt, Calvin. 1908 Bridgewater. South St.
 1894 Pratt, Charles Augustus. New Bedford. 60 Orchard St.
 1908 Pratt, David Damon. New Bedford. 319 Union St.
 1915 Pratt, Emily Adelaide. Gardner. H. Heywood Mem. Hosp.
 1913 Pratt, Ezekiel. Arlington. 374 Mass. Av.
 1892 Pratt, John Washburn. Dedham. St. Paul. Sq.
 1898 Pratt, Joseph Hersey. Brookline. Office, Boston. 317 Marlboro' St.
 1908 Pratt, Mason Ross. Syracuse, N. Y. 110 Marshall St.

1884 Preble, Wallace.....Cambridge. 22 Applan Way.
 1910 Preble, William Emerson...Boston. 416 Marlboro' St.
 1908 Prenn, Joseph.....Boston. 583 Beacon St.
 1865 Presbrey, Silas Dean Taunton. 103 Weir St.
 1867 Prescott, Charles Dudley New Bedford.
 1915 108 South Ash St.
 1905 Prescott, Henry Dudley...New Bedford.
 176 William St.
 1886 Prescott, William Herbert...Forest Hills (Boston).
 330 Hyde Park Av.
 1915 Price, Oscar Jay.....Somerville.
 345 Highland Av.
 1901 Priest, Herbert Bancroft...Ayer.
 1907 Prince, Calvin Oliver.....Plymouth. 286 Court St.
 1861 Prince, James Perrott Durbam, Natal.
 1866 1902 South Africa.
 1879 Prince, Morton.....Boston. 458 Beacon St.
 1881 Prior, Charles Edwin...Malden. 1 Mountain Av.
 1903 Pritchard, William Fall River.
 Percival 12 Hudner Bldg.
 1896 Procter, Thomas Walter...Sandwich.
 1891 Proctor, Francis Ingersoll. Wellesley. Office. Boston.
 397 Marlboro' St.
 1897 Proctor, John Donald.....Keene, N. H. 61 Winter St.
 1898 Proctor, Joseph Whipple...Malden. 235 Clifton St.
 1894 Proctor, Percy Clement...Gloucester. 40 Middle St.
 1907 Proctor, Thomas Melville...Walpole.
 1900 Provandie, Paul Hector...Melrose Highlands (Melrose).
 8 Ashland St.
 1914 Provost, Raoul Gaston...Taunton. State Hospital.
 1912 Pulsiford, Nathan.....Lowell. 40 Middlesex St.
 1910 Pulsiford, Walter Hall...Whitman. Bank Block.
 1906 Purvis, Charles Burleigh Brookline. 1455 Beacon St.
 1910
 1870 Putnam, James Jackson...Boston. 106 Marlboro' St.
 1877 Putnam, Joseph Morrill...Chelsea. West Medford (Medford).
 62 Austin St.
 1902 Putnam, Ralph.....Winchester. 127 Main St.
 1894 Putnam, Willard Abram...Cambridge. 9 Dana St.

Q

1886 Qua, Lester Robert.....Pepperell. Main St.
 1890 Quackenbush, Alexander...Boston. 143 Newbury St.
 1913 Quannell, Willard Leslie...Cambridge. 19 Upland Rd.
 1905 Quessey, Alfred Henry...Fitchburg. 64 Prichard St.
 1909 Quest, James Francis...Dorchester (Boston).
 Office, Boston.
 209 Huntington Av.
 1869 Quinby, Hosea Mason Worcester 656 Main St.
 1911
 1903 Quinby, William Carter...Baltimore. Md.
 Johns Hopkins Hospital.
 1872 Quint, Norman Perkins West Medway (Medway).
 1887 1912

R

1898 Rabe, Edith Ruth Meek Boston. 481 Beacon St.
 1914 Rabinovitz, Bernard.....Springfield. 1082 North St.
 1912 Rackemann, Francis Minot. Milton. Brush Hill Rd.
 P. O. Readville.
 1892 Raddin, Frederick Stocker. Chelsea. 448 Broadway.
 1892 Rand, John William...Amesbury. 108 Main St.
 1896 Rand, Richard Baxter...North Abington.
 (Abington).
 1897 Randall, Clifford Walcott...Worcester. 723 Main St.
 1915 Rappoport, Boris.....Salem. 315 Essex St.
 1896 Rawson, George Wallace...Amherst. 27 Main St.
 1907 Raymond, Charles Stanley. South Hadley.
 59 College St.
 1908 Raymond, Katharine Platt. Wellesley.
 Wellesley College.
 1904 Raymond, Loring Hay...Somerville.
 146 Highland Av.
 1902 Raynes, Myrton Berry...Melrose.
 42 West Emerson St.
 1889 Reagh, Arthur Lincoln...West Roxbury (Boston).
 39 Maple St.

1905 Reardon, Daniel Quincy. 22 School St.
 Bartholomew
 1893 Reardon, Timothy Joseph...Boston.
 76 Commonwealth Av.
 1896 Reddy, Joseph Warren...South Boston (Boston).
 211 K St.
 1892 Redmond, James William...South Boston (Boston).
 512 Broadway.
 1907 Redmond, Thomas Henry...Lawrence.
 256 Haverhill St.
 1908 Reed, Laurence Bradford...Plymouth. 20 North St.
 1898 Reed, Victor Augustus...Lawrence. 477 Essex St.
 1883 Reed, William Gilman...Southbridge. Main St.
 1910 Reese, John Arnold...Attleborough. 57 Bank St.
 1913 Regan, James Joseph...South Boston (Boston).
 220 Dorchester St.
 1912 Reggio, André William...Boston. 40 Fairfield St.
 1907 Reid, Isadore Eugene Jamaica Plain (Boston).
 Rosenstein Office, Boston.
 43 Tremont St.
 1910 Reid, William Duncan...Newton. 36 Hyde Av.
 1900 Reilly, James Aloysius...Dorchester (Boston).
 1675 Dorchester Av.
 1911 Reilly, Thomas Edward...Marlborough. 6 Newton St.
 1884 Reynolds, Edward...Boston. 321 Dartmouth St.
 1889 Reynolds, Henry Vose...Dorchester (Boston).
 21 Cushing Av.
 1906 Reynolds, John Timothy...Quincy. 90 Copeland St.
 1913 Reynolds, Ralph Leavitt...Waterville, Me. 207 Main St.
 1866 Rice, Albert Raymond 1906 Springfield. 36 Temple St.
 1906 Rice, Allen Galpin...Springfield. 42 Maple St.
 1865 Rice, Austin Bradford Fiskdale (Sturbridge).
 1898
 1866 Rice, Charles Henry...Fitchburg. 12 Prichard St.
 1893 Rice, Frederick Winslow...Brighton (Boston).
 16 Elko St.
 1908 Rice, John Everts...Worcester. 862 Main St.
 1903 Rice, Robert Astley...Fitchburg. 2 Crescent St.
 1896 Rice, Walter Henry...Boston. 290 Newbury St.
 1903 Rich, Charles Edwin...Lynn. 56 Estes St.
 1894 Richards, Caroline Maria...New York. N. Y.
 601 West 115th St.
 1913 Richards, Cyril Godfrey...Boston.
 Long Island Hospital.
 1883 Richards, George Edward Boston. 11 Gloucester St.
 1911
 1893 Richards, George Lyman...South Dartmouth (Dartmouth).
 Office, Fall River.
 124 Franklin St.
 1891 Richardson, Anna Gove...Boston. 483 Beacon St.
 1888 Richardson, Benjamin Lynn. 20 Silsbee St.
 Franklin
 1903 Richardson, Charles Pittsfield. 8 Bank Row.
 Harper
 1907 Richardson, Cheslie Alvah West Somerville (Somerville).
 731 Broadway.
 1908 Richardson, Edward Boston. 224 Beacon St.
 Peirson
 1904 Richardson, Frank Linden...Jamaica Plain (Boston).
 Office, Boston.
 543 Boylston St.
 1906 Richardson, Horace Bradford, Me. Box 115.
 Kimball
 1896 Richardson, Mark Wyman...Jamaica Plain (Boston).
 Office, Boston.
 67 Milk St. Room 23.
 1913 Richardson, Oscar...Boston. 483 Beacon St.
 1867 Richardson, William Boston.
 Lambert 225 Commonwealth Av.
 1895 Richmond, Ernest Dalton...Reading. 24 Woburn St.
 1898 Richmond, Simon...Roxbury (Boston).
 271 Humboldt Av.
 1914 Riemer, Hugo Bruno Norwood. 62 Winter St.
 Charles
 1911 Riggs, Austen Fox...Stockbridge.
 1910 Riley, Augustus...Boston.
 536 Commonwealth Av.
 1907 Riley, Charles Allen...Allston (Boston).
 96 Harvard Av.
 1900 Riley, Elizabeth Angela...Boston. 45 Bay State Rd.

- 1906 Riley, John Henry.....North Adams. 103 Main St.
 1898 Ring, Arthur Hallam.....Arlington Heights
 (Arlington).
 1906 Riordan, Walter Daniel....Lawrence. 187 Newbury St.
 1883 Ripley, Frederick Jerome....Brookton. 12 Cottage St.
 1904 Ripley, Horace Greeley....Taunton. State Hospital.
 1903 Ripley, William Littlefield. Newton. 249 Center St.
 1906 Riskey, Edward Hammond. Boston. 31 Mass. Av.
 1904 Ritter, Henry.....Springfield. 42 Main St.
 1906 Roach, Alfred John.....Tewksbury.
 State Infirmary.
 1915 Robb, Hunter.....Cambridge. 56 Brattle St.
 1906 Robbins, Chandler.....Weston. Office, Boston.
 356 Marlboro' St.
 1880 Robbins, Elliott Daniels....Boston. 38 Tremont St.
 1901 Robbins, Elmer Ellsworth...New Bedford.
 101 School St.
 1907 Robbins, Eugene Stanley...New Bedford.
 17 South 6th St.
 1891 Robbins, Fred Gibson.....Salem. Office, Boston.
 129 Marlboro' St.
 1906 Robbins, William Bradford. Boston. 356 Marlboro' St.
 1897 Roberts, Frederick Alpha....Pittsfield. 230 North St.
 1895 Roberts, Linneus Alton....Dorchester (Boston).
 699 Washington St.
 1911 Robertson, Ewan.....Lowell. 295 Central St.
 Alexander
 1914 Robertson, Jessie.....Cambridge. 2253 Mass Av.
 Wilhelmine
 1895 Robey, William Henry, Jr....Boston.
 202 Commonwealth Av.
 1900 Robie, Alice Hatheway.....Watertown.
 Purvis 102 Mt. Auburn St.
 1898 Robie, Walter Franklin....Baldwinsville (Templeton).
 Pine Terrace Sanatorium.
 1914 Robins, Samuel Alexander. Lynn. Lynn Hospital.
 1902 Robinson, Harry Pringle....Amesbury. 155 Main St.
 1914 Robinson, Henry Ashton...Marlborough.
 18 Cotting Av.
 1888 Robinson, Lucy Morton †1915. Brockton. 7 Main St.
 1911 Robinson, Solomon.....Worcester. 141 Green St.
 1890 Robinson, Thomas Johns....Taunton. 56 Broadway.
 1893 Robinson, William Henry....Jamaica Plain (Boston).
 430 Center St.
 1895 Robinson, William Perry....Haverhill. 1403 Broadway.
 1883 } Roche, Thomas Francis....Blackstone.
 1898 }
 1908 Roche, Thomas Neil.....New Bedford.
 279 County St.
 1904 Rochette, Edward Charles..Worcester. 18 Portland St.
 1915 Rochford, Grace Elizabeth. Roxbury (Boston).
 61 Parker Hill Av.
 1914 Rochford, Richard.....South Boston (Boston).
 Augustine Carney Hospital.
 1901 Rockwell, Alfred Elijah...Worcester. 248 Main St.
 Perkins
 1901 Rockwell, Herbert George. Amherst. 25 Main St.
 1914 Roderick, Charles Elvin....West Somerville (Somerville). 1139 Broadway.
 1914 Rodger, James Yeams.....Lowell.
 Lowell Gen. Hospital.
 1903 Rodrick, Albert Fowler....Fitchburg. 38 Prichard St.
 1890 Rogers, Albert Edward.....Boston. 261 Beacon St.
 1909 Rogers, Edmund Augustus. Brookline 129 Harvard St.
 1883 Rogers, Frank Alvin.....Everett. 534 Broadway.
 1914 Rogers, John Andrews....Lowell.
 Lowell Corp. Hospital.
 1906 Rogers, Mark Homer.....Belmont. Office, Boston.
 483 Beacon St.
 1873 Rogers, Orville Forrest...Dorchester (Boston).
 465 Washington St.
 1914 Rogers, Orville Forrest, Jr. Dorchester (Boston).
 465 Washington St.
 1890 Rolfe, William Alfred....Boston. 230 Dartmouth St.
 1902 Rollins, Edwin Theodore...Jamaica Plain (Boston).
 17 Gordon St.
 1910 Rood, Adolphus Duncan...Whitman. 414 South Av.
 1907 Rood, Luther Colby.....Dorchester (Boston).
 Office, Boston.
 419 Boylston St.
 1914 Root, Raymond Richmond. Georgetown.
 34 East Main St.
 1868 Root, Richmond Barbour...Georgetown. North St.
 1902 Rose, William Henry.....Worcester. 9 Elm St.
 1904 Rose, William Milton.....Cambridge. 230 Prospect St.
 1910 Rosen, David William.....Boston. 321 Hanover St.
 1911 Rosenau, Milton Joseph....Brookline. Office,
 Roxbury (Boston).
 240 Longwood Av.
 1907 } Rosenbloom, Carl Webber. Holyoke. 245 Maple St.
 1910 }
 1914 }
 1914 Rothblatt, Harry Lewis....Boston. 13 Allen St.
 1907 Roughan, Charles Michael. Lowell. 29 Bridge St.
 1885 Round, Arthur Morey.....Norton. Taunton Av.
 1914 Rounseville, Wilfred.....Attleborough. 40 Bank St.
 Ellsworth
 1906 Rowe, Carleton Allen.....East Milton (Milton).
 1871 Rowe, George Howard.....Boston. 11 Ivy St.
 Malcolm †1911
 1892 Rowen, Henry Stanislaus..Brighton (Boston). Office,
 Boston. 520 Beacon St.
 1897 Rowley, William.....Lanesville (Gloucester).
 1087 Washington St.
 1906 Roy, Joseph Napoleon.....Webster. 38 Main St.
 1895 Royal, Herbert Benjamin...Harvard. Still River Rd.
 1905 } Rubin, Solomon Hyman...Roxbury (Boston).
 1915 } 484 Blue Hill Av.
 1868 } Ruddick, William { South Boston (Boston).
 1891 } Henderson †1914 { 502 Broadway.
 1913 Ruel, Joseph Adjutor.....Haverhill. 14 Main St.
 1905 Rumrill, Samuel Dudley...Springfield. 46 Main St.
 1892 Ruppel, Carl Emil Fraser. Lynn. 23 Nahant St.
 1888 Ruppel, Myra Daniel.....Lynn. 23 Nahant St.
 1906 Rushford, Edward Allan....Salem. 175 Lafayette St.
 1908 Rushmore, Stephen.....Roxbury (Boston).
 Office, Boston.
 522 Commonwealth Av.
 1898 Russell, Edward Ervin.....North Adams. 127 River St.
 1906 Russell, Frederick James...Waverley. Box C.
 1899 Russell, Simon James.....Springfield.
 154 Chestnut St.
 1905 Russell, Walter Burton....Springfield. 796 State St.
 1904 Ruston, Warren Dunn.....West Somerville (Somerville). 744 Broadway.
 1886 Ryan, Dennis Matthew....Ware. 38 Pleasant St.
 1910 Ryan, Sylvester Edward....Springfield. 13 Hancock St.
 1912 Ryan, William Francis....Lowell. 219 Central St.
 1913 Ryan, William Patrick....Holyoke. 260 Maple St.
 1906 Ryder, Delano Richmond...Fall River. 124 Franklin St.
 1901 Ryder George Hale.....Quincy. Office, Boston.
 583 Beacon St.
 1882 Ryder, Godfrey.....Malden. 321 Pleasant St.
 1914 Ryder, Walter Irenaeus....South Boston (Boston).
 Office, Boston.
 394 Marlboro' St.
- S**
- 1873 Sabine, George Krans.....Brookline. 30 Irving St.
 1898 Sabine, Jane Downes Kelly. Boston. 348 Marlboro' St.
 1911 Sadler, Roy Angelo.....Boston.
 1750 Washington St.
 1915 Safford, Moses Victor.....Jamaica Plain (Boston).
 15 Grovenor Rd.
 1904 Safford, Wilber Pray.....Brockton. 52 Pleasant St.
 1895 St. Clair, Austin Emery....Framingham.
 63 Concord St.
 1894 St. Denis, Joseph Nelson...Mattapan (Boston).
 74 Blue Hill Av.
 1893 St. Germain, Joseph Pierre. New Bedford.
 13 South 6th St.
 1912 Salles, John Murray.....New Bedford.
 113 Grinnell St.
 1909 Sanborn, Byron.....Topsfield. Central St.
 1876 Sanborn, Edwin Aaron...Somerville. 24 Franklin St.
 †1915
 1883 } Sanborn, Frederick James. Spencer. Main St.
 1888 }
 1902 Sanborn, George Phippen..Boston.
 320 Commonwealth Av.
 1897 Sanborn, John Wesley....Roxbury (Boston).
 168 Humboldt Av.
 1881 Sanborn, Perley Lewis....Marblehead. 79 Pleasant St.

- 1870 Sanders, Charles Barton Lowell. 475 Westford St.
 1909 Sandler, Samuel.....Fall River. 298 Third St.
 1904 Sanger, Guy Edward.....Arlington. 707 Mass. Av.
 1893 Sargent, Ara Nathaniel.....Salem. 116 Federal St.
 1889 Sargent, George Amory.....Boston. 46 Hereford St.
 1896 Sargent, George Bancroft.....Lawrence. 51 Jackson St.
 1907 Sargent, Oscar Franklin.....Lawrence. 105 Exeter St.
 Libbey
 1905 Sargent, Walter Leslie.....Quincy. 1155 Hancock St.
 1913 Saunders, Edmund Louis.....Brookline. Office, Boston.
 46 Gloucester St.
 1908 Savignac, Arthur Noël.....Amesbury. 80 Friend St.
 1884 Sawin, Charles Dexter.....Somerville. 390 Broadway.
 1892 Sawin, Robert Valentine.....Brimfield.
 1907 Sawyer, Alpha Reuben.....Roslindale (Boston).
 6 Conway St.
 1883 Sawyer, Edward Allen.....Gardner. 402 Elm St.
 1901 Sawyer, Edward Keyes.....Boston. 419 Boylston St.
 1884 Sawyer, Elihu LeRoy.....Roslindale (Boston).
 6 Conway St.
 1891 Sawyer, Walter Fairbanks. Fitchburg. 67 Prichard St.
 1888 Sayles, Joseph Borland.....Taunton. 35 City Square.
 1896 Scales, Robert Bass.....Dorchester (Boston).
 546 Washington St.
 1912 Scanlan, Maurice Thomas..Dorchester (Boston).
 421 Geneva Av.
 1905 Scanlan, Thomas John.....Dorchester (Boston).
 Office, Boston.
 543 Boylston St.
 1903 Scannell, David Daniel.....Boston.
 366 Commonwealth Av.
 1912 Schadt, George Leonard.....Springfield. 350 Central St.
 1910 Schillander, Carl Axel.....Springfield. 293 Bridge St.
 1910 Schirmer, Joseph Walter.....Boston. 272 Newbury St.
 1900 Schmidt, Frederick Sextus. Roxbury (Boston).
 179 School St.
 1906 Schmidt, Richard Diedrich. Dorchester (Boston).
 16 River St.
 1909 Schneider, Harry Albert.....Pittsfield. 30 North St.
 1898 Schneider, Jacob Philip.....Palmer. 10 Thorndike St.
 1905 Schofield, Otho Lester.....Wellesley Hills
 (Wellesley).
 1915 Schofield, Roger William.....Worcester. City Hospital.
 1900 Schorer, Cornelia.....Roxbury (Boston).
 Bernhardine Johanna
 74 Fenwood Rd.
 1879 Schwab, Emanuel.....Cincinnati, O.
 2732 Woodburn Av.
 1907 Schwartz, Myer.....Lawrence. 261 Common St.
 1895 Scoboria, Arthur Gilmore.....Chelmsford.
 1885 Scofield, Walter W.....Dalton. Main St.
 1910 Scott, George Henry.....Roxbury (Boston).
 476 Warren St.
 1915 Scott, Norman McLean.....Boston.
 536 Commonwealth Av.
 1882 Scribner, Ernest Varian.....Worcester. State Hospital.
 1887 Scudder, Charles Locke.....Boston. 209 Beacon St.
 1884 Sears, George Gray.....Boston. 426 Beacon St.
 1897 Sears, Harry Edward.....Beverly. 25 Broadway.
 1887 Sears, Henry Francis.....Boston. 86 Beacon St.
 1903 Sears, Julia Seton.....Address unknown.
 1900 Sears, Stephen Hull.....Yarmouth Port
 (Yarmouth).
 1905 Seaver, Edwin Pliny, Jr....New Bedford.
 179 William St.
 1914 Seavy, Hollis Lester.....Cambridge. Roseland St.
 1889 Seelye, Ralph Holland.....Springfield. 73 Chestnut St.
 1902 Seelye, Walter Clark.....Worcester. 390 Main St.
 1915 Segall, Samuel Kelman.....New Bedford.
 1208 Acushnet Av.
 1905 Segur, Willard Blossom.....Enfield. Bridge St.
 1908 Senesac, Archibald.....New Bedford.
 Napoleon
 1007 South Water St.
 1914 Sennott, John Ralph.....Cambridge. 321 Broadway.
 1901 Sever, James Warren.....Cambridge. Office, Boston.
 234 Marlboro' St.
 1913 Sewall, Edgar Floyd.....Somerville. 281 Broadway.
 1869 Seymour, Christopher 1908 Northampton. 79 Elm St.
 1904 Seymour, Malcolm.....Boston.
 362 Commonwealth Av.
 1911 Shadman, Alonzo Jay.....West Roxbury (Boston).
 1857 Cent St.
 1881 Shanahan, John.....Peabody. 69 Main St.
 1896 Shanahan, Thomas Joseph. Brookline.
 155 Aspinwall Av.
 1910 Shanahan, Timothy Joseph. Somerville. Office, Boston.
 419 Boylston St.
 1915 Shanks, Charles.....New Bedford.
 645 Kempton St.
 1913 Shannahan, Richard Joseph. Worcester. 925 Main St.
 1894 Shannon, Nat Vaughan....Cambridge. 891 Mass. Av.
 1915 Shapira, Albert Abraham..Boston. 583 Beacon St.
 1914 Shapira, Victor Isaiah....Dorchester (Boston).
 Office, Boston.
 160 Huntingdon Av.
 1891 Shatswell, James Arthur...Beverly. 9 Endicott St.
 1895 Shattuck, Albert Milo.....Worcester. 21 High St.
 1873 Shattuck, Frederick.....Boston. 135 Marlboro' St.
 Cheever
 1873 Shattuck, George Brune...Boston. 183 Beacon St.
 1908 Shattuck, George Cheever..Boston. 205 Beacon St.
 1912 Shaughnessy, Thomas Ahern. Leominster. 62 Main St.
 1907 Shaw, Adam Ernest.....Lowell. 137 Merrimack St.
 1893 Shaw, Albert Joel.....Lowell. 79 Mountfort St.
 1893 Shaw, Arthur John.....Boston. 551 Boylston St.
 1915 Shaw, Francis.....Somerville. 57 Cross St.
 1904 Shaw, John Port.....Brookton. 6 North Main St.
 1909 Shaw, John William.....Newburyport. 7 Orange St.
 1897 Shaw, Thomas Bond.....Worcester. 24 Oxford St.
 1877 Shaw, Thomas Pierpont..Lowell. 110 Eighteenth St.
 1909
 1913 Shaw, Walter Augustus....Springfield. 105 Ashley St.
 1908 Shay, Charles Edwin.....Roxbury (Boston).
 136 Warren St.
 1895 Shay, Thomas Maguire....Roxbury (Boston).
 88 Warren St.
 1897 Shea, John Joseph.....San Diego, Calif.
 2417 "M" St.
 1906 Shea, Michael Ignatius....Chicopee Falls (Chicopee).
 112 Belcher St.
 1902 } Shea, Peter Owen.....Worcester. 106 Millbury St.
 1912 }
 1895 Shea, Thomas Bernard....Boston. 74 Marlboro' St.
 1909 Sheahan, George Maurice...Quincy. 12 School St.
 1897 Sheehan, Martin David....Stoneham. 34 Pleasant St.
 1893 Sheehan, William Joseph...Salem. 146 Federal St.
 1905 Sheehan, William Joseph...South Boston (Boston).
 197 Broadway.
 1876 Sheldon, Chauncey.....Lynn. 73 North Common St.
 Coolidge
 1912 Sheldon, Russell Firth....Boston. 30 Pinckney St.
 1911 Sheppard, Philip Albert..Dorchester (Boston).
 Edward
 24 Monadnock St.
 1912 Shepherd, William Gordon. Lynn.
 121 North Common St.
 1904 Sherburne, Andrew.....Dorchester (Boston).
 Edward
 46 Brent St.
 1913 Sheridan, Philip Edward..South Boston (Boston).
 Anthony
 580 Broadway.
 1882 Sherman, Frank Morton....West Newton (Newton).
 11 Fairview Ter.
 1894 Sherman, Mary Hastings...Brookfield.
 1907 Sherman, Warren Hunter..Westford.
 1914 Shields, Ellwood Emlen....Annisquam (Gloucester).
 39 Leonard St.
 1910 Shoemaker, Amzi Bedell...North Attleborough.
 123 Commonwealth Av.
 1905 Shoninger, Lee Simon.....New York, N. Y.
 41 West 55th St.
 1894 Shores, Harvey Towle.....Northampton. 78 Main St.
 1869 Shreve, Octavius Barrel..Salem. 29 Chestnut St.
 1906
 1914 Shulman, David Hermann..Roxbury (Boston).
 106 Glenwood St.
 1897 Shultis, Frederick Charles..Leominster. 20 Main St.
 1908 Sibley, Benjamin Ernest...Brookline. 1595 Beacon St.
 1881 Sidney, Austin Wilbur..Fitchburg. 24 Holt St.
 1909
 1896 Silva, Francis Pierce.....Charlestown (Boston).
 206 Main St.

1901 Simmons, Channing Chamberlain	Boston. 317 Marlboro' St.	1914 Smith, William David....Gardner. Office, Boston. 99 Commonwealth Av.	
1914 Simmons, Edward Burnside..Worcester. 900 Main St.		1914 Smith, William Francis....Malden. 14 Wentworth Court.	
1905 Simmons, Fred Albert....Brookton. 63 Main St.		1898 Smith, William Henry.....Boston. 10 Gloucester St.	
1903 Simmons, Hannah Coralynn	Worcester. 900 Main St.	1891 Smith, William Lord.....North Grafton (Grafton). Office, Boston.	
1914 Simmons, Ralph Hayward...Fall River. Union Hospital.		1894 Smithwick, Marsena Parker	Lexington. Office, Boston. 483 Beacon St.
1912 Simon, Arthur Leslie.....Lawrence. 24 Buswell St.		1902 Smyser, Charles James.....Harwich.	
1915 Simonds, Frederick Artemas	Cambridge. 1311 Mass. Av.	1911 Smyth, Duncan Campbell..Brookline. Office, Boston. 127 Newbury St.	
1910 Simonds, Otis Franklin....Philadelphia, Pa. Wells Hospital.		1905 Smyth, Patrick Somers...Brookline. Office, Boston. 69 Newbury St.	
1885 Simpson, Charles Edward...Lowell. 9 Central St.		1903 Snow, Frank Whipple.....Newburyport. 24 Essex St.	
1890 Simpson, James Edwin.....Salem. 26 Chestnut St.		1899 Snow, Frederick Stedman..Roxbury (Boston). 160 Townsend St.	
1903 Sims, Frederick Robertson..Melrose. 79 West Foster St.		1908 Sobotky, Irving.....Boston. 366 Commonwealth Av.	
1905 Sinceltico, Giuseppe.....Lawrence. 3 Jackson Ter.		1915 Solomon, Harry Caesar....Roxbury (Boston). 74 Fenwood Road.	
1903 Sise, Lincoln Fleetford....Medford. Office, Boston. 69 Newbury St.		1876 Somers, John Edward.....Cambridge. 1979 Mass. Av.	
1896 Siskind, Alexander Louis...Lawrence. 272 Broadway.		1894 Sophor, Curtis Levi.....Wakefield. 6 Avon St.	
1913 Sisson, Mitchell.....East Boston (Boston). 26 Princeton St.		1897 Soule, Horace John.....Winthrop. 180 Winthrop St.	
1863 Skinner, Edward Manning 1903	Boston. 586 Mass. Av.	1904 Southard, Elmer Ernest...Cambridge. Office, Roxbury (Boston). 240 Longwood Av.	
1915 Skirball, Louis Irving.....Revere. 146 Shirley Av.		1904 Southard, Mabel Austin....Cambridge. 70 Francis Av.	
1904 Slack, Francis Hervey.....Boston. City Hall Annex.		1900 Souther, Robert.....Boston. 133 Newbury St.	
1910 Slater, Eleanor Mary.....Denton, Texas. College of Industrial Arts.		1904 Spald, Charles Jacob.....Springfield. 344 Belmont Av.	
1913 Slaterry, John Richard....South Boston (Boston). Office, Boston.		1897 Spalding, Fred Maurice...Brookline. Office, Boston. 39 Huntington Av.	
1905 Sleeper, Frank Warren....Dorchester (Boston). 41 Virginia St.		1903 Spalding, Roger.....Duxbury. Washington St.	
1906 Slutskin, Maurice Louis....Springfield. 120 Main St.		1884 Sparhawk, Clement Willis..Danvers. 148 Locust St.	
1900 Small, Albert Ernest.....Melrose. 90 West Emerson St.		1914 Sparks, Ernest Elliot....Cochituate (Frammingham). Main St.	
1908 Smalley, Fred Lyman.....Reading. 13 Hampden St.		1910 Sparrow, Charles Atsatt...Worcester. 744 Main St.	
1915 Smillie, Wilson George....Cambridge. Office, Roxbury. 240 Longwood Av.		1910 Spaulding, Edith Rogers...Frammingham. P. O. Box 99.	
1898 Smith, Alfred Charles.....Brookton. 7 Main St.		1911 Spaulding, John Doliver..Mansfield. Office, Boston. 360 Commonwealth Av.	
1893 Smith, Charles Morton....Boston. 437 Marlboro' St.		1874 Spear, Edmund Doe.....Jamaica Plain (Boston). Office, Boston.	
1900 Smith, Charlotte Stewartson	Manchester, N. H. 83 Hancock St.	1907 Spear, Louis Mahlon.....Brookline. Office, Boston. 483 Beacon St.	
1914 Smith, Conrad.....Boston. 143 Newbury St.		1915 Spinney, Frederic Ira.....Somerville. 897 Broadway.	
1901 Smith, Edward Shepard....Westfield. 3 Court St.		1909 Spooner, Lesley Hinckley..Boston. 260 Clarendon St.	
1912 Smith, Edwin Wallace....Boston. 19 Bay State Rd.		1865 Sprague, Francis Peleg...Boston. 229 Commonwealth Av.	
1915 Smith, Ernest Elmer.....Worcester. City Hospital.		1873 } Sprague, Rufus William { Charlestown (Boston). 1891 } 376 Main St.	
1902 Smith, Forster Hanson....Lowell. 832 Merrimack St.		1913 Sprague, Russell Bradford..Boston. 522 Commonwealth Av.	
1909 Smith, Frank Herbert....Hadley.		1904 Sproull, John.....Haverhill. 50 Merrimack St.	
1894 Smith, Frank Simpson....Address unknown.		1879 Squier, Angelo Orin.....Springfield. 293 Bridge St.	
1895 Smith, Fred Stevens....North Andover. 5 Third St.		1892 Stacey, Charles Franklin..Boston. 456 Audubon Rd.	
1894 Smith, Frederick Glazier..Somerville. 145 Highland Av.		1902 Stack, Charles Francis....Hyde Park (Boston). 1315 River St.	
1882 Smith, George Carroll....Boston. 416 Marlboro' St.		1908 Stack, John Joseph.....Dorchester (Boston). Office, Boston.	
1910 Smith, George Gilbert....Boston. 309 Marlboro' St.		1913 Stafford, Frank Dalmon...North Adams. 56 Summer St.	
1903 Smith, Hervey Lewis....Springfield. 249 Union St.		1880 Standish, Myles.....Boston. 72 St. James Av.	
1885 } Smith, Hiram Fredley { Orange. 155 South Main St.		1909 Stanley, Francis Guy.....Beverly. 144 Cabot St.	
1892 } Markley {		1895 Stanley, Josiah Murch...Northborough. Main St.	
1901 Smith, Howard Harry....Boston. 845 Boylston St.		1907 Stansfield, Clarence Winfield	1274 North Main St.
1906 Smith, John Hall.....Roslindale (Boston). Office, Boston.		1915 Stansfield, Oliver Holt....Worcester. 55 Pleasant St.	
1910 Smith, John Jay.....Cambridge. 89 Inman St.		1903 Stanton, Joseph.....Brighton (Boston). Office, Boston.	
1887 Smith, Mary Almira.....Boston. 83 Newbury St.		1908 Stanwood, Frederic Arthur..Wellesley Hills (Wellesley). 342 Washington St.	
1889 Smith, Murdoch Campbell..Lynn. 3 Lee Hall.		1905 Staples, Clarence Hathorne	Malden. 339 Pleasant St.
1906 Smith, Myrtle.....Worcester. 390 Main St.		1912 Staples, Hall.....West Acton (Acton).	
1897 Smith, Peter Matthew....Boston. 758 Tremont St.		1893 Stapleton, Richard Henry..Worcester. 48 Trumbull St.	
1908 Smith, Richard Mason....Boston. 329 Beacon St.			
1874 Smith, Samuel Finley....Indian Orchard (Springfield). 97 Myrtle Av.			
1906 Smith, Stafford Baker....New York, N. Y. Hotel Bretton Hospital			
1903 Smith, Theobald.....Princeton, N. J. Rockefeller Institute.			
1894 Smith, Thomas Burke....Lowell. 107 Merrimack St.			
1884 Smith, Walter Anson.....Springfield. 185 State St.			
1914 Smith, William Benjamin..Bondsville (Palmer). Tyng			

- 1893 Starbird, Edward Perley...Dorchester (Boston).
9 Monadnock St.
- 1910 Stearns, Albert Warren....Billerica. Office, Boston.
520 Commonwealth Av.
- 1903 Stearns, Robert Thomas...Mattapan (Boston).
24 Hazelton St.
- 1868 Stebbins, George Stanford Springfield. 17 Maple St.
†1905
- 1874 Stedman, George.....Boston. 380 Newbury St.
- 1874 Stedman, Henry Rust.....Brookline. Office, Boston.
48 Beacon St.
- 1892 Stedman, Joseph Cyrus....Jamaica Plain (Boston).
7 Lakeville Pl.
- 1901 Steele, Albert Edward.....Roslindale (Boston).
(Robert St.
- 1913 Steeves, Ernest Colpitt....Essex. Main St.
- 1907 Stephens, Frederick Newton Somerville. Office, Boston.
527 Beacon St.
- 1883 Stephenson, Franklin U. S. Navy (retired).
Bache †1913 Claremont, Calif.
- 1914 Sternberg, Joseph Edward...Roxbury (Boston).
Office, Boston.
100 Boylston St.
- 1898 Stetson, Frank Elliot.....New Bedford. 334 Union St.
- 1898 Stetson, Frederick Winslow.Roxbury (Boston).
504 Warren St.
- 1896 Stetson, Halbert Greenleaf.Greenfield. 17½ Federal St.
- 1869 Stevens, Andrew Jackson Malden. 599 Main St.
- 1894 Stevens, Charles Benjamin.Worcester. 61 Pearl St.
- 1868 Stevens, Edmund Horace...Cambridge. 1911 Mass. Av.
- 1874 Stevens, George Beckwith Dorchester (Boston).
†1911 346 Seaver St.
- 1906 Stevens, Harold Elmer Lewiston, Me. 374 Main St.
Ellsworth
- 1897 Stevens, Henry Burt.....West Roxbury (Boston).
Office, Boston.
419 Boylston St.
- 1891 Stevens, Henry Lawrence..New Bedford.
129 Purchase St.
- 1908 Stevens, Horace Paine....Cambridge. 14 Garden St.
- 1899 Stevens, Ralph Emerson...Marlborough.
133 West Main St.
- 1897 Stevens, Sara Elmina.....West Roxbury (Boston).
31 Linnet St.
- 1886 Stevens, Serial.....Roslindale (Boston).
942 South St.
- 1883 Stevens, William Caldwell.Worcester. 17 Russell St.
- 1915 Stevens, William Russell...Abington. 64 Center Av.
- 1883 } Stevens, William Stanford.Boston. 295 Beacon St.
- 1913 }
- 1914 Stevenson, Effie Allyne....North Grafton (Grafton).
State Colony.
- 1904 Stevenson, Willis Mack....North Easton (Easton).
Lincoln St.
- 1909 Stewart, Ralph Carroll....Lowell. 408 Middlesex St.
- 1909 Stewart, Vernon Champney Woburn. 16 Summer St.
- 1903 Stick, Henry Louis.....Worcester. State Asylum.
- 1881 Stickney, Clifford Webster.Holden. Main St.
- 1892 Stickney, Edwin Pangman.Arlington. 58 Pleasant St.
- 1884 Stickney, George Augustus.Beverly. 205 Cabot St.
- 1901 Stiles, Fred Merritt.....Waltham. 292 Moody St.
- 1908 Still, Carroll Wilder.....Haverhill. 156 Main St.
- 1880 Stimson, John Woodbury...Fitchburg. 101 Prichard St.
- 1907 Stockbridge, Alberto Lynn. 69 Park St.
Horatio
- 1899 } Stockwell, Edgar { Great Barrington.
1911 } Washburn { 6 Church St.
- 1899 Stockwell, Herbert Emmons Stockbridge. Main St.
- 1899 Stoddard, Mortimer Joseph.Springfield. 106 Bay St.
- 1914 Stokes, Leroy Tyler.....Haverhill.
355 Washington St.
- 1887 Stone, Arthur Kingsbury...Boston. 44 Fairfield St.
- 1893 Stone, Byron.....North Oxford (Oxford).
- 1913 Stone, Charles Edwin.....Lynn. 145 No. Common St.
- 1885 Stone, Charles Sinclair....Boston. 752 Tremont St.
- 1886 Stone, Frank Ellsworth....Lynn. 92 So. Common St.
- 1889 Stone, George Arthur.....Roxbury (Boston).
P. B. Brigham Hospital.
- 1910 Stone, George Henry.....Boston. City Hospital.
- 1914 Stone, Henry Edward.....Dorchester (Boston).
41 Fowler St.
- 1894 Stone, James Savage.....Boston. 234 Marlboro' St.
- 1912 Stone, Jane Gray.....Jamaica Plain (Boston).
821 Center St.
- 1854 Stone, Lincoln Ripley Newton. 131 Vernon St.
†1907
- 1896 Stone, Moses Cornelius Wellesley. 18 Belair St.
†1908
- 1905 Stone, Ralph Edgarton....Beverly. 360 Cabot St.
- 1909 Stone, Thomas Newcomb...Haverhill. 28 White St.
- 1905 Stoneman, Edgar Amos....Springfield. 14 Clinton St.
- 1888 Storer, Malcolm.....Boston. 476 Boylston St.
- 1906 Storrs, Henry Randolph....Vancouver, B. C.
342 Bender St.
- 1891 Stowell, Edmund Channing.Dublin, N. H.
- 1903 Stowell, Frank Edgar.....Worcester. 19 Elm St.
- 1895 Stowell, Joab.....North Amherst (Amherst).
- 1892 Stowell, Sarah Russell....Dublin, N. H.
- 1902 Stratton, Ralph Ricker....Melrose. 654 Main St.
- 1904 Street, Charles Edward....Springfield. 2 Maple St.
- 1900 Street, Lionel Alexander Shanghai, China.
Burnet 15 Wanhoo Road.
- 1914 Streeter, Edward Clark....Boston. 280 Beacon St.
- 1905 Streeter, John Frank.....Springfield. 55 Walnut St.
- 1913 Strom-Lindsay, Marie....Tewksbury. State Inf.
- 1913 Strong, Richard Pearson...Boston. Office, Roxbury.
240 Longwood Av.
- 1915 Strong, Seth Lake.....Marshfield Hills (Marshfield).
Summer St.
- 1886 Stuart, Frederic William..South Boston (Boston).
550 Broadway.
- 1880 } Stuart, James Henry....Boston. 236 Clarendon St.
- 1890 }
- 1898 Stubbs, Frank Raymond...Newton. 510 Center St.
- 1898 Sturgis, Benjamin Salem. 28 Pleasant St.
Franklin, Jr.
- 1896 Sturgis, Walter Horatio Allerton (Hull).
Wakeman
- 1905 Sturnick, Max.....Dorchester (Boston).
12 Columbia Rd.
- 1892 Stutson, William Peckham Cummington. Main St.
†1915
- 1899 Sughrue, Dennis Francis...Roxbury (Boston).
430 Dudley St.
- 1911 Suito, Henry Albert.....South Deerfield (Deerfield). Graves Av.
- 1910 Sullivan, Andrew Joseph...Brockton. 155 Main St.
- 1907 Sullivan, Charles Brent...Boston. 520 Beacon St.
- 1906 Sullivan, Cornelius South Braintree
Augustine (Braintree).
835 Washington St.
- 1903 } Sullivan, Edward { Springfield. 317 Main St.
- 1914 } Coppinger { Framingham.
- 1915 Sullivan, Elizabeth Ann...Reformatory for Women.
Haverhill. 42 White St.
- 1903 Sullivan, Florence Augustine Cambridge.
- 1914 Sullivan, Francis Augustus.Providence, R. I.
376 Cambridge St.
- 1883 Sullivan, James Edmund...Providence, R. I.
254 Wayland Av.
- 1883 Sullivan, James Francis...Lowell. 230 Pawtucket St.
- 1915 Sullivan, John Albert....Pittsfield. 72 Summer St.
- 1901 Sullivan, John Joseph....Dorchester (Boston).
93 Bowdoin St.
- 1907 Sullivan, John Thomas...Dorchester (Boston).
Office, Boston.
520 Beacon St.
- 1913 Sullivan, Joseph Cornelius.Springfield. Mercy Hosp.
- 1905 Sullivan, Joseph Lawrence.Roxbury (Boston).
89 Waverley St.
- 1913 Sullivan, Leo Jeremiah....Fall River. 379 Whipple St.
- 1909 Sullivan, Martin George...Winchendon. 216 Central St.
- 1891 Sullivan, Michael Francis..Lawrence. 281 Oak St.
- 1913 Sullivan, Patrick Joseph...Dalton. 10 Carvon Av.
- 1889 Sullivan, William Joseph...Lawrence. 67 Essex St.
- 1901 Sumner, Harry Herbert....Lowell 4 Merrimack Sq.
- 1896 Sumner, Philip Sosnoski...Boston. 28 Westland Av.

- 1900 Swain, Howard Townsend...Brandford, Conn.
1865 Swan, Charles Walter Lowell. 19 Elm St.
1903 119 Livingstone Av.
1908 Swan, Lawrence Clarke...Beverly. 23 Bow St.
1910 Supple, Edward Augustine...Boston. 409 Marlboro' St.
1882 Swan, Roscoe Wesley...Worcester. 41 Pleasant St.
1885 Swan, William Donnellson...Cambridge. 167 Brattle St.
1913 Swanson, Axel Fridolf...Cummington.
1891 Swasey, Edward...Worcester 390 Main St.
1863 Swasey, Oscar Fitzallan...Beverly. 24 Hale St.
1900
1912 Sweeney, Bartholomew Leominster. 30 Water St.
Philip
1908 Sweeney, Edward Joseph...Springfield. 2½ Main St.
1911 Sweeney, Michael Thomas...Norfolk Downs (Quincy). Hancock St.
1895 Sweet, Frederick Benoni...Springfield. 81 Chestnut St.
1893 Sweetser, Charles Leslie...Lowell. 276 Westford St.
1889 Sweetser, Frederick Merrimac.
Ellsworth
1907 Swift, Edith Hale...Boston.
110 Bay State Road.
1901 Swift, Henry Marshall...Portland, Me.
30 Deering St.
1910 Swift, John Baker...Boston. 419 Beacon St.
1908 Swift, Milne Barker...Orlando, Fla.
1907 Swift, Walter Babcock...Boston.
110 Bay State Road.
1905 Sylvester, Albie Warren...Pittsfield. 150 North St.
1901 Sylvester, Charles Porter...Hull. Office, Boston.
460 Audubon Road.
1914 Sylvester, Nathan West Somerville (Somerville). 1121 Broadway.
Rowland, Jr.
1907 Sylvester, Philip Haskell...Newton Center (Newton). 866 Beacon St.
1893 Sylvester, William Hillman...Natick. 6 Clarendon St.
1900 Symonds, Alice Gertrude...Haverhill. 175 Main St.
1893 Synan, William Edward...Fall River. 620 William St.
- T**
- 1897 Taft, Albert Atherton...Keene, N. H. 56 Court St.
1906 Talbot, Fritz Bradley...Boston. 311 Beacon St.
1915 Talbot, John Edward...Holliston. Office, Boston.
24 McLean St.
1883 Tallman, Augustus East Boston (Boston). 9 Princeton St.
Littlefield
1915 Taveira, Arthur Joaquim...New Bedford.
1505 Acushnet Av.
1894 Taylor, Edward Wyllys...Boston. 457 Marlboro' St.
1903 Taylor, Erwin Hartwell...Pittsfield. 316 North St.
1882 Taylor, Frederic Weston...Cambridge. 1735 Mass. Av.
1901 Taylor, Frederick Leon...Dorchester (Boston).
321 Center St.
1893 Taylor, George Lyman...Holyoke. 247 Maple St.
1900 Taylor, James, Jr...Worcester. 49 Pearl St.
1888 Taylor, Jubal George...Los Angeles, Calif.
Security Tr. Co.
1909 Taylor, Roy Arnold...Waltham. 266 Moody St.
1908 Taylor, Walter...Florence (Northampton). 70 Maple St.
1908 Teahan, William...Holyoke. 245 Maple St.
1909 Tedford, Ada Helena...Woburn. 51 Pleasant St.
1880 Temple, William Franklin...Boston. 499 Beacon St.
1913 Temple, William Boston. 499 Beacon St.
Franklin, Jr.
1914 Ten Broeck, Carl...Boston. 2 Walnut St.
1893 Ten Broeck, Stanton Jacob...Orange. 15 Grove St.
1891 Tenney, Benjamin...Boston. 308 Marlboro' St.
1886 Tenney, John Arthur...West Roxbury (Boston). Office, Boston.
419 Boylston St.
1894 Tenney, William Northend...Canton. Office, Boston.
419 Boylston St.
1913 Tennis, Matthew Nicholas...Fall River. Union Hosp.
1892 Thayer, Eugene...Roxbury (Boston). Office, Boston. 419 Boylston St.
1901 Thayer, Hartley Wales...Newtonville (Newton). 355 Walnut St.
1914 Thom, Douglas Armour...Monson. State Hospital.
- 1894 Thomas, Caroline Louise...Malden. 43 Florence St.
1911 Thomas, Charles Hoyt...Cambridge. 1718 Mass. Av.
1912 Thomas, Elmer Ellsworth...Northampton. 160 Main St.
1889 Thomas, John Jenks...Boston. 88 Bay State Rd.
1911 Thomas, William Kilpatrick...Cambridge. 1718 Mass. Av.
Smith
1897 Thomes, John Blanchard...Pittsfield. 86 North St.
1914 Thompson, Charles Arthur...Newton Highlands (Newton). 1099 Walnut St.
1903 Thompson, Charles Edward...East Gardner (Gardner). State Colony.
1891 Thompson, Charles Oscar...Boston. 589 Beacon St.
1870 Thompson, Frederick Fitchburg. 3 Pleasant St.
Henry
1904 Thompson, Frederick Fitchburg. 168 Prichard St.
Henry, Jr.
1906 Thompson, George Hocken...North Adams. 38 Ashland St.
1896 Thompson, John Joseph...Webster. 16 Lake St.
1915 Thompson, John Stephen...Cambridge. 1525 Cambridge St.
1898 Thompson, Peter Hunter...Boston. 308 Commonwealth Av.
1899 Thompson, Richard Henry...Malden. 82 Summer St.
1899 Thorn, Edwin Cyrus...Deerfield.
1887 Thorndike, Augustus...Boston. 601 Beacon St.
1887 Thorndike, Paul...Boston. 24 Marlboro' St.
1903 Thorndike, Townsend Boston. 20 Newbury St.
William
1893 Thorn'on, James Brown...Boston. 168 Huntington Av.
1911 Thorpe, Burton Durrell...Newport, N. H.
1907 Thurber, Madison Dorchester (Boston). Templeton 91 Savin Hill Av.
1915 Tiani, Bernardo...Lawrence. 197 Oak St.
1915 Tibbetts, Guy Daniel...Cambridge. 330 Mt. Auburn St.
1890 Tibbetts, James Thomas...Mineola, N. Y.
1890 } Tigh, Frederick...Newburyport. 134 High St.
1904 }
1898 Tighe, Michael Aloysius...Lowell. 9 Central St.
1899 Tilden, Irving Niles...Mattapoisett. Barstow St.
1913 Tilton, Earle Edward...Allston (Boston). Office, Boston. 483 Beacon St.
1892 Tilton, Frank Herbert...East Boston (Boston). 15 Princeton St.
1882 Tilton, Josiah Odin...Lexington.
1911 Timmins, Edward Francis...South Boston (Boston). 527 Broadway.
1901 Tingley, Louisa Paine...Boston. 9 Mass. Av.
1906 Tinkham, Oliver Goldsmith...Brighton (Boston). Office, Boston. 527 Beacon St.
1893 Tirrell, Vinson Meader...South Weymouth (Weymouth).
1881 Titcomb, George Eugene...Concord. 7 Sudbury St.
1912 Titus, Raymond Stanton...Boston. 31 Mass. Av.
1880 Tobey, George Loring...Clinton. 205 Church St.
1907 Tobey, George Loring, Jr...Boston. 416 Marlboro' St.
1886 Tolman, Julia...Arlington. 695 Mass. Av.
1913 Tomkies, James Scott...Rochester, Minn. St. Mary's Hospital.
1906 Toohy, Thomas Victor...Brookline. Office, Roxbury (Boston). 129 St. Alphonsus St.
1911 Toppan, Roland Lesley...Newburyport. 31 Green St.
1904 Torbert, James Rockwell...Boston. 252 Marlboro' St.
1914 Torney, George Henry...Brookline. Bournewood Hospital.
1913 Torrey, Arthur Stanley...Gloucester. 164 East Main St.
1872 Torrey, Samuel William Beverly. 103 Cabot St.
1909
1905 Tower, Freeman Augustus...Derry, N. H.
1914 Towle, Clarence Clarke...Somerville. 24 Prospect Hill Av.
1908 Towle, Edwin Dudley...Salem. 2 Mason St.
1891 Towle, Harvey Parker...Boston. 453 Marlboro' St.
1877 Towle, Henry Charles...Dorchester (Boston). 1428 Dorchester Av.
1915 Towne, Edward Bancroft...Roxbury (Boston). P. B. Brigham Hospital.

- 1885 Townsend, Charles Boston. 76 Marlboro' St.
Wendell
- 1901 Townsend, David.....River Glade, N. B.
1901 Tozier, Charles Herman...Winchester. Office, Boston.
100 Boylston St.
- 1891 Tracy, Edward Aloysius....South Boston (Boston).
489 Broadway.
- 1905 Tracy, John Matthew.....Springfield.
168 Chestnut St.
- 1887 Tracy, Thomas Henry.....Address unknown.
1910 Tracy, William Leighton...Pittsfield. 8 Bank Row.
1901 Trainor, John Brett.....Fall River.
1515 South Main St.
- 1906 Trainor, Joseph Aloysius...Cambridge 103 Belmont St.
1906 Trask, John Wilson.....Lynn. 171 Lewis St.
1906 Traves, William Henry, Jr., Boston. 511 Mass. Av.
1894 Treanor, John Peter.....Dorchester (Boston).
3 Howes St.
- 1912 Tripp, Edwin Prescott.....Falmouth. Locust St.
1897 Tripp, George Alston.....Worcester.
477 Cambridge St.
- 1854 Trow, William Marshall Newtonville (Newton).
1892 95 Highland Av.
- 1885 Trowbridge, Edward Henry Worcester. 58 Pleasant St.
1893 Trueman, Harmon Silas...Somerville. 145 Sumner St.
1915 Trueman, Nelson Gore.....Hathorne (Danvers).
State Hospital.
- 1903 Truesdale, Philemon Fall River. 151 Rock St.
Edwards
- 1915 Trull, Alfred Chase.....Haverhill. 48 White St.
1868 Trull, Washington Benson Boston. 18 West Cedar St.
1912
- 1909 Tryon, Geneva.....Cambridge. 7 Oxford St.
1906 Tucker, Arthur Wallace...Lynn. 285 Western Av.
1875 Tucker, Edward Tobey New Bedford.
1915 258 Pleasant St.
- 1908 Tucker, George Everett...Salem. 86 Federal St.
1894 Tucker, Samuel Chase.....Peabody. 16 Chestnut St.
1911 Tuholski, David Benjamin..Brookton. 105 Main St.
1891 Tully, Edward Joseph.....Fitchburg. 98 Prichard St.
1875 Tupper, Augustus Rockport. Main St.
Maclauchlan
- 1914 Turetsky, William Leo.....Dorchester (Boston).
1071 Blue Hill Av.
- 1912 Turnbull, Frederick Myles..Allston (Boston).
40 Harvard Av.
- 1912 Turnbull, John Archibald Allston (Boston).
84 Harvard Av.
- 1907 Turner, Charles Sampson..Providence, R. I.
532 Prairie Av.
- 1910 Turner, William Kenneth..New Bedford.
1105 Acushnet Av.
- 1887 Tuttle, Albert Henry.....Cambridge. Office, Boston.
1083 Boylston St.
- 1879 Tuttle, George Thomas...Waverley (Belmont).
McLean Hospital.
- 1885 Twitchell, Edward Thayer..Dorchester (Boston).
25 Alban St.
- 1882 Twitchell, George Pierce...Greenfield. 17 1/2 Federal St.
1886 Twombly, Edward Lambert Boston. 416 Marlboro' St.
- 1905 Tyler, Winsor Marrett.....Lexington. 454 Mass. Av.
1910 Tynan, Josepa Patrick.....South Boston (Boston).
499 Broadway.
- 1904 Tyrode, Maurice Paul Boston. 416 Marlboro' St.
Octave Vêjux
- 1906 Tyzzer, Ernest Edward....Wakefield.
Office, Roxbury (Boston).
240 Longwood Av.
- U**
- 1912 Underhill, Elizabeth South Hadley.
Colden Mt. Holyoke College.
- 1915 Underhill, Samuel Graham..Lynn. 212 Boston St.
1884 Underwood, George Baker..Gardner. 105 Central St.
1858 Underwood, George Belmont. 5 Common St.
Latham 1898
- 1914 Utiac, Thomas Vincent...Lawrence. 131 Haverhill St.
1897 Upton, Charles Louis.....Shelburne Falls
(Shelburne). Main St.
- 1904 Urquhart, John Edwin....Ashfield.
- V**
- 1893 Valentine, Henry Charles..Lexington.
1892 Van Allen, Harvey Ward..Springfield. 19 Maple St.
1908 Van Nijys, Fresenius.....Weston. Central Av.
1914 Varney, Elton Murray.....Peabody. 72 Main St.
1895 Varney, Fred Elbridge....North Chelmsford
(Chelmsford).
- 1897 Vaughan, Jonas Hobart....Tampa, Fla.
214 South Brevard Av.
- 1912 Verde, Luigi.....Cambridge. Office, Boston.
372 Hanover St.
- 902 Verhoeff, Frederick Boston. 101 Newbury St.
Herman
- 1882 Vickery, Herman Frank....Boston. 263 Beacon St.
1892 Vickery, Lucia Florence...Jamaica Plain (Boston).
27 Lakeville Place.
- 1897 Vitor, Agnes Caecilia.....Boston. 175 Dartmouth St.
1878 Viles, Clarence Albertus...Lowell. 855 Bridge St.
1904 Vincent, Beth.....Boston. 295 Beacon St.
1910 Vosburgh, Stephen Earle...Augusta, Me.
Maine Insane Hosp.
- 1897 Vose, Robert Henry.....Boston. 443 Beacon St.
1896 Voss, John William.....Beverly. 366 Cabot St.
- W**
- 1902 Wadsworth, Richard Boston.
Goodwin 522 Commonwealth Av.
- 1914 Wagner, Emma Juliet.....West Somerville (Somerville).
370 Highland Av.
- 1914 Wainshel, Percy William..Lynn. 125 Summer St.
1908 Waite, Lucy Reed.....Southbridge.
1886 Wakefield, Albert Tolman..Sheffield.
1906 Walch, Joseph Francis....Lawrence. 131 Haverhill St.
1904 Walcott, Henry Joel.....Concord. 92 Union St.
1863 Walcott, Henry Pickering..Cambridge.
11 Waterhouse St.
- 1906 Walcott, William Wright..Natick. 32 W. Central St.
1866 Walker, Augustus Cambridge. 5 Acacia St.
Chapman 1901
- 1913 Walker, Clifford Black....Jamaica Plain (Boston).
706 South Huntington Av.
- 1902 Walker, David Harold....Boston.
390 Commonwealth Av.
- 1908 Walker, Harry Abram....Somerville. 472 Broadway.
1910 Walker, Irving James.....Allston (Boston).
Office, Boston.
- 1914 Walker, Isaac Chandler....Boston. 697 Huntington Av.
1915 Walker, Melvin Harvey, Jr..Pittsfield. 34 Fenn St.
1894 Walker, William.....Revere. 780 Winthrop Av.
1905 Walker, William Dacre....Andover. 121 Main St.
1876 Wallace, Alonzo Stewart...Nashua, N.H. 198 Main St.
1905 Wallace, Anna Marie.....Waverley (Belmont).
Lock Box C.
- 1898 Wallace, George Loney....Wrentham.
1910 Wallace, Harold Lowe....Allston (Boston).
530 Cambridge St.
- 1899 Walsh, Charles Joseph....Cambridge. 2004 Mass. Av.
1913 Walsh, Edmund Francis...Boston. 121 Pinckney St.
1904 Walsh, John Edward.....Revere. 238 Beach St.
1880 Walton, George Lincoln...Boston. 199 Marlboro' St.
1897 Walton, William Joseph...Dorchester (Boston).
Office, Boston.
- 1904 Ward, Edward Silvanus...North Attleborough.
84 North Washington St.
- 1886 Ward, George Otis.....Worcester. 875 Main St.
1904 Ward, Roy Joslyn.....Worcester. 397 Pleasant St.
1913 Ward, William Greenleaf..Lynn. 150 Essex St.
1907 Wardle, Henry.....Fall River.
863 Plymouth Av.
- 1907 Wardwell, James Knight...Boston. 1111 Boylston St.
1908 Warner, Carmillus Turten..Marlborough.
75 West Main St.
- 1901 Warren, Alva Harding....Everett. 634 Broadway.
1905 Warren, Edward Dane....Holyoke. 283 Maple St.
1905 Warren, Franklin Bridgewater. Central Sq.
Lafayette
- 1908 Warren, Hobart Endicott...Ashburnham. Main St.

1869 Warren, John.....	Boston. 58 Beacon St.	1915 Wheat, Harry Ray.....	Boston. 541 Commonwealth Av.
1866 Warren, John Collins.....	Boston. 58 Beacon St.	1906 Whelan, Charles.....	Hingham. Central St.
1907 Warren, Lizzie Maude.....	Waverley (Belmont). Box 341.	1910 Whelan, Edmond Vincent.....	Bridgewater. 35 School St.
1860 Warren, Orin.....	†1899 West Newbury (Newbury).	1894 Whipple, Farrington.....	Boston. 1079 Boylston St.
1909 Warren, Thomas Francis.....	Fall River. 591 Middle St.		Hasham
1892 Washburn, Elliott.....	Rutland. State Sanatorium.	1885 Whitaker, Clarence Wilder	Worcester. 44 Pleasant St.
1899 Washburn, Frank Hall.....	Holden.	1905 Whitecher, Burr Royce.....	West Somerville (Somerville). 1040 Broadway.
1897 Washburn, Frederic.....	Boston. Augustus	1884 Whitcombe, Charles Reed.....	Roslindeale (Boston). 23 South Fairview St.
1886 Washburn, George Hamlin.....	Boston. 377 Marlboro' St.	1910 White, Arthur Joseph.....	Mattapan (Boston). 249 River St.
1901 Waterman, George Arthur.....	Boston. 410 Beacon St.	1894 White, Belle Platt.....	Springfield. 182 Sumner A.
1895 Watkins, Royal Phillips.....	Worcester. 17 West St.	1893 White, Charles James.....	Boston. 259 Marlboro' St.
1878 Watson, Francis Sedgwick.....	Boston. 92 Marlboro' St.	1902 White, Clifford Allen.....	Granville. P. O. Box 150.
1899 Watson, Frank Gilman.....	Dorchester (Boston). 11 Virginia St.	1914 White, Everett.....	Lynn. 17 Marianna St.
1908 Watson, John William.....	Boston. 613 Beacon St.	1896 White, Franklin Warren.....	Boston. 322 Marlboro' St.
1911 Watters, Henry.....	Newton Center (Newton). 661 Commonwealth Av.	1914 White, George Arthur.....	Cambridge. 170 Harvard St.
1907 Watters, William Henry.....	West Roxbury (Boston). Office, Boston.	1912 White, Henry Alverado.....	Taunton. 17 West Britannia St.
1915 Watts, Henry Adelbert.....	Malden. 170 Pleasant St.	1882 White, Herbert Warren.....	Roxbury (Boston). 151 Humboldt Av.
1894 Watts, Henry Fowler.....	Dorchester (Boston). Ransford	1856 White, James Clarke.....	†1911 Boston. 259 Marlboro' St.
1908 Weaver, Harry Vernon.....	New Bedford. 6 Monadnock St.	1910 White, John Robert.....	Lynn. 166 Washington St.
1908 Webb, Harold Randall.....	Arlington. 22 Pleasant St.	1893 White, Leon Edward.....	Wellesley. Office, Boston. 397 Marlboro' St.
1880 Webster, Frederick Ward.....	Newton. 465 Center St.	1872 White, Levi.....	Worcester. 7 Gates St.
1865 Webber, Samuel Gilbert.....	Brookline. 60 Gorham Av. †1911	1909 White, Lucy Nye.....	Winthrop. 813 Winthrop Av.
1915 Webber, Wolfert Gerson.....	Needham. 888 Highland Av.	1899 White, Michael William.....	Somerville. 21 Walnut St.
1888 Webster, George Arthur.....	Boston. 419 Boylston St.	1911 White, Paul Dudley.....	Boston. Mass. Gen. Hosp.
1859 Webster, Joseph Rowe.....	North Lexington (Lexington). †1908	1913 White, Robert Marshall.....	Dorchester (Boston). 276 Bowdoin St.
1890 Weeks, Joshua Franklyn.....	New Bedford. County Rd.	1892 White, William Allen.....	Roxbury (Boston). 249 Warren St.
1894 Weiser, Walter Rupert.....	Springfield. 97 Chestnut St.	1894 Whitehill, George Edward.....	Everett. 516 Broadway.
1894 Welch, Edward John.....	Lowell. 10 East Merrimack St.	1897 Whiteside, George.....	Portland. Ore. 710 Dekum Bldg.
1913 Weller, John Henry.....	State Farm (Bridgewater).	1892 Whiting, George.....	Somerville. Washington Whitney
1846 Wellington, James Lloyd.....	Swansea. †1883	1886 Whitney, Charles Melville.....	Boston. 386 Commonwealth Av.
1900 Wells, Abner Toothaker.....	Canton, Ohio. 315 Cherry Av., W. E.	1882 Whitney, Edward Melville.....	New Bedford. 27 South 6th St.
1912 Wells, Charles Edward.....	Boston. 233 Charles St.	1905 Whitney, Edward William.....	Indian Orchard (Springfield). 162½ Main St.
1907 Wells, David Washburn.....	West Newton (Newton). Office, Boston. Hotel	1910 Whitney, George Burgess.....	Haverhill. 252 Washington St.
1878 Wells, Frank.....	Boston. 120 Franklin St.	1901 Whitney, Harriet Wiley.....	Indian Orchard (Springfield). 162½ Main St.
1906 Wells, Orion Vassar.....	Westford.	1905 Whitney, Ray Lester.....	Waverley (Belmont). McLean Hospital.
1891 Wentworth, Arthur Howard.....	Boston. 352 Marlboro' St.	1874 Whitney, William Fiske.....	Boston. 228 Marlboro' St.
1909 Wentworth, Mark Hunking.....	Boston. 86 Bay State Rd.	1904 Whiton, Ross Kittredge.....	Bedford.
1904 Wernick, Ben Zion G.....	Roxbury (Boston). Office. Boston. 259 Hanover St.	1910 Whittemore, William.....	Cambridge. 39 Brattle St.
1874 Wescott, William Henry.....	Roxbury (Boston). †1913	1906 Whittemore, Wyman.....	Boston. 330 Dartmouth St.
1880 West, Edward Graeff.....	Roxbury (Boston). 66 Clifton St.	1891 Whitten, George Edwin.....	Haverhill. 154 Main St.
1910 West, Frederick Orra.....	Woburn. 57 Pleasant St.	1887 Whittier, Francis Fremont.....	Brookline. 94 Harvard St.
1894 West, George Leon.....	Newton Center (Newton). 860 Beacon St.	1900 Whoriskey, John Joseph.....	Cambridge. 1712 Mass. Av.
1894 Weston, George Dake.....	Springfield. 70 Main St.	1914 Wickham, Thomas William.....	South Boston (Boston). Carney Hospital.
1912 Wetherbee, Lucy Emma.....	Worcester. 2 King St.	1874 Wight, Daniel Webster.....	West Medford (Medford). †1902
1882 Wetherbee, Roswell.....	Cambridge. 798 Mass. Av.	1891 Wilbur, Hubert Granville.....	Fall River. 292 North Main St.
1898 Wetherell, Arthur Bryant.....	Holyoke. 180 Chestnut St.	1887 Wilbur, Sarah Mann.....	Springfield. 319 State St.
1915 Wheatley, Frank Edward.....	North Abington (Abington). 174 Adams St.	1910 Wilcox, De Witt Gilbert.....	Brookline. Office, Boston. 419 Boylston St.
1884 Wheatley, Frank George.....	North Abington (Abington). 174 Adams St.	1907 Wilcox, Henry Hopson.....	Springfield. 151 North Main St.
1893 Wheeler, Alfred Augustus.....	Leominster. 48 Mt. Pleasant Av.	1896 Wilder, Winford Oliver.....	Pittsfield. 34 Fenn St.
1894 Wheeler, Charles Douglas.....	Worcester. 18 Chestnut St.	1906 Wilmsky, Charles Francis.....	Boston. 80 Green St.
1908 Wheeler, Charles Holmes.....	Haydenville (Williamsburg).	1914 Wilkins, George Arthur.....	Revere. 646 Beach St.
1897 Wheeler, Emma Hammond.....	New Bedford. 57 Morgan St.	1900 Wilkins, George Clarence.....	Manchester. N. H. 795 Elm St.
1870 Wheeler, Leonard.....	Worcester. 12 Chestnut St.	1909 Wilkins, Samuel Henry.....	West Medford (Medford). 411 High St.
1900 Wheeler, Lucia Anna.....	Wernersville, Pa. State Asylum.	1898 Williams, Abram Case.....	Springfield. 137½ State St.

- 1894 Williams, Augusta Gilbert. Brookline. 278 Walnut St.
 1887 Williams, Charles Crosby. Pasadena, Cal.
 1874 } Williams, Charles Herbert { 943 Los Robles Av.
 1895 } Milton. Office, Boston.
 1879 } 1069 Boylston St.
 1915 Williams, David Lawrence. Boston.
 1902 Williams, Edward Denison. Easthampton. 153 Union St.
 1894 Williams, Edward Russell. Cambridge. Office, Boston.
 1069 Boylston St.
 1872 Williams, Edward Tufts Roxbury (Boston).
 †1910 125 Dudley St.
 1877 Williams, Francis Henry. Boston. 505 Beacon St.
 1915 Williams, Frank Earle. Cambridge.
 1894 Williams, Frank Percival. Brookline. Office, Boston.
 44 Langdon St.
 1880 Williams, Harold. Boston. 528 Beacon St.
 1897 Williams, Harry Edwin. Mount Vernon, Me.
 1887 Williams, Henry Clarence. Boston. 140 Boylston St.
 1899 Williams, Hugh. Boston. 301 Beacon St.
 1906 Williams, John Thomas. Boston. 483 Beacon St.
 1882 Williams, Joseph. Dorchester (Boston).
 12 Bloomfield St.
 1898 Willis, Charles Austin. Waltham. 562 Main St.
 1870 Willis, Reuben. †1908 Somerville. 285 Broadway.
 1914 Willoughby, Earle Carlisle. Tewksbury. State Infirmary.
 1894 Wilson, Charles Oscar. Lowell. 614 Gorham St.
 1913 Wilson, Charles Moore. Salem. 54 Washington St.
 1910 Wilson, Edmund Winfred. Boston. City Hospital.
 1904 Winchester, George Wesley. Mattapan (Boston).
 1411 Blue Hill Av.
 1888 Winn, Charles Henry. Roxbury. 1474 Tremont St.
 1908 Winslow, Benjamin Sabert. New Bedford.
 1065 South Water St.
 1893 Winslow, Edward Smith. Easthampton. 103 Main St.
 1903 Winslow, Frederick Bradlee. Boston. 275 Clarendon St.
 1911 Wiseman, John Ignatius. Dorchester (Boston).
 State Hospital. Austin St.
 1897 Withee, Frederick Newton Highlands
 Elmarien (Newton). 9 Forest St.
 1892 Withington, Alfreda Pittsfield. 17 Clinton Av.
 Bosworth
 1880 Withington, Charles Boston. 35 Bay State Rd.
 Francis
 1904 Wolbach, Simeon Burt. Boston. 420 Beacon St.
 1907 Wood, Benjamin Ezra. Allston (Boston). Office,
 Boston. 520 Beacon St.
 1882 } Wood, Henry Austin. Waltham. 751 Main St.
 1888 }
 1903 Wood, Henry Walton. New Bedford. 446 County St.
 1885 Wood, Leonard. U. S. Army.
 1899 Wood, Mary Anna. Pittsfield. 147 Pomeroy Av.
 1901 Wood, Nathaniel Knight. Boston. 259 Beacon St.
 1911 Wood, Nelson Merwin. Charlestown (Boston).
 Office, Boston.
 19 Bay State Road.
 1889 Wood, Norman Perkins. Northfield. Main St.
 1899 Woodbury, Frank Taylor. Wakefield. 23 Chestnut St.
 1899 Woodbury, Herbert Elwell. Indianapolis, Ind.
 1512 North Delaware St.
 1873 Woodbury, Louis Augustus Groveland. 23 Elm Park.
 1891 Woodbury, William Boston. 216 Newbury St.
 Richardson
 1907 Woodill, Edith Esty. Waverley (Belmont).
 Lock Box C.
 1902 Woodruff, Richard Allen. Pittsfield. 73 North St.
 1899 Woods, Charles Edwin. Lunenburg. Lancaster Av.
 1879 } Woods, George Lyman Springfield. 60 Sherman St.
 1897 } †1915
 1882 Woods, Jonathan Henry. Brookline.
 167 Salisbury Road.
 1893 Woodward, Johnson Rufus Oxford.
 1882 Woodward, Lemuel Fox. Worcester. 52 Pearl St.
 1877 Woodward, Samuel Worcester. 58 Pearl St.
 Bayard
 1879 Woodworth, Dwight Fitchburg. 882 Main St.
 Sidney
 1902 Woodworth, John Dawson Jamaica Plain (Boston).
 Roswell 9 Greenough Av.
 1883 Worcester, Alfred. Waltham. 751 Main St.
 1873 Workman, William Worcester.
 Hunter †1912
 1901 Wormelle, Charles Burton. Allston (Boston).
 75 Gardner St.
 1902 Worth, Edward Philip. Edgartown.
 1904 Worthen, Charles Arthur. Lynn. 32 Mall St.
 1914 Worthen, Clarence Fred. Weston. Central Av.
 1896 Worthington, Arthur Dedham. 26 Court St.
 Morton
 1897 Wright, George Hermann. New Milford, Conn.
 24 Monument Sq.
 1894 Wright, James Homer. Boston.
 Mass. Gen. Hospital.
 1910 Wright, William Francis. Fall River. 160 Robeson St.
 1895 Wylie, Eugene Cushman. Dorchester (Boston).
 556 Washington St.
 1894 Wylie-Cushman, Ella Boston. 711 Boylston St.
 Rosalind
 1912 Wyman, Edwin Theodore. Boston. 483 Beacon St.
 Y
 1903 Yeaton, George William. Medway. Village St.
 1897 Yenetchi, Henry Somerville.
 Ainsworth 104 Highland Av.
 1895 Yoosuf, Abraham Kevork. Worcester. 23 Chandler St.
 1915 Young, Annie Roberts. Waltham. 794 Main St.
 1895 Young, Edgar William. Everett. 640 Broadway.
 1910 Young, Edward Boston. 87 Marlboro' St.
 Lorraine, Jr.
 1914 Young, Edward Wallace. New Bedford. 403 Union St.
 1897 Young, Ernest Boyen. Boston. 434 Marlboro' St.
 1906 Young, Evangeline Wilson. Boston. 168 Newbury St.
 1907 Young, James Herbert. Newton. 19 Baldwin St.
 1882 Young, John Francis. Brookline. 1821 Beacon St.
 1905 Young, Ralph Randal. Roxbury (Boston).
 5 Highland St.
 1905 Young, Roy Demas. Arlington. 788 Mass. Av.
 1908 Young, Walter Harding. Dedham. Office, Boston.
 39 Newbury St.
 1899 Young-Slaughter, Emma Lowell. 100 Westford St.
 Elizabeth
 Z
 1888 Zabriskie, Frank Hunter. Greenfield. 426 Main St.
 1913 Zimmerman, Henry. Springfield. 721 North St.

Massachusetts Medical Society

LOCAL DIRECTORY

THE FELLOWS LISTED ACCORDING TO THEIR SITUATION
IN THE VARIOUS CITIES, TOWNS AND POST
OFFICES OF THE STATE

JANUARY 1, 1916

LOCAL DIRECTORY

THE FELLOWS LISTED ACCORDING TO THEIR SITUATION IN THE VARIOUS CITIES, TOWNS
AND POST OFFICES OF THE COMMONWEALTH.

NOTE.—Names of District Societies are printed in lower-case Roman. Names of cities are printed in capitals. Names of towns are printed in small capitals. Names of villages and post offices are printed in lower-case Italics.

ABINGTON (Plymouth).
(See also: North Abington.)
Hutchinson, W. P.
Stevens, W. R.

ACTON (Middlesex North).
(See also: West Acton).

ACUSHNET (Bristol North).

ADAMS (Berkshire).
Boom, A. K.
Crowley, J. F.
Holmes, H. B.
Pascoe, W. W.

AGAWAM (Hampden).
(See also: Feeding Hills.)

ALFORD (Berkshire).

Allerton (HULL).
Sturgis, W. H. W.

Allston (Brighton) (BOSTON).
Barrier, E. A.
Casey, J. F.
Dadmun, E. J.
Dow, E. S.
Giddings, H. G.
†Goldthwaite, S. V.
Haslam, F. A.
Lovell, M. E.
McKeen, S. F.
Riley, C. A.
Tilton, E. E.
Turnbull, J. A.
Walker, I. J.
Wallace, H. L.
Wood, B. E.
Wormelle, C. B.

AMESBURY (Essex North).
Adams, J. Q.
†Douglass, J. A.
Leslie, H. G.
Mudge, O. P.
Mullen, P. J.
Murphy, D. D.
Rand, J. W.
Robinson, H. P.
Savignac, A. N.

AMHERST (Hampshire).
(See also: Cushman, North Amherst.)
Bowen, J. F.
Haskell, N. C.
Irwin, G. G.
Rawson, G. W.
Rockwell, H. G.

ANNISQUAM (Gloucester).
Shields, E. E.

ANDOVER (Essex North).
Abbot, C. E.
Clark, J. D.
Conroy, E. C.
Fuller, J. R.
Look, P. J.
Walker, W. D.

ARLINGTON (Middlesex South).
(See also: Arlington Heights.)

Atwood, C. F.
Buckley, D. J.
Dennett, C. A.
Keegan, C. A.
Lawley, B. I.
Pratt, Ezekiel.
Sanger, G. E.
Stickney, E. P.
Tolman, Julia
Webb, H. R.
Young, R. D.

Arlington Heights (ARLINGTON).
Farrington, L. M.
Ring, A. H.

ASHBURNHAM (Worcester North).
Bates, C. A.
Fosgate, E. G.
Warren, H. E.

ASHBY (Worcester North).
Pope, F. F.

ASHFIELD (Franklin).
Urquhart, J. E.

ASHLAND (Middlesex South).
Morse, R. S.

ATHOL (Worcester North).
Cuddy, J. F.
Dodge, G. F.
Perry, G. L.

Atlantic (QUINCY).
Bartlett, F. A.
Bruce, D. A.
Drew, M. E.

ATTLEBOROUGH (Bristol North).
Battershall, J. W.
Battershall, M. H. W.
Clarke, J. W.
Conro, A. C.
Hewitt, W. O.
Holden, C. S.
Kent, R. P.
Mackie, L. V. G.
Milot, W. F.
Murphy, F. V.
Reese, J. A.
Rounseville, W. E.

AUBURN (Worcester).

Auburndale (NEWTON).
Godfrey, H. W.
Haskell, H. H.
Hutchinson, C. P.
Keever, H. F.
Porter, F. E.

AVON (Plymouth).
Elliott, R. A.
Linfield, E. P.

AYER (Worcester North).
Bulkeley, F. S.
Hopkins, B. H.
Priest, H. B.

Baldwinsville (TEMPLETON).
Libby, M. A.
Page, H. W.
Robie, W. F.

BARNSTABLE (Barnstable).
(See also: Cotuit, Hyannis, Osterville.)
Millikin, C. W.

BARRE (Worcester).
Bates, W. S.
Brown, G. A.

BECKET (Berkshire).
Dearborn, H. H.

BEDFORD (Middlesex North).
Hamblen, E. E.
Whiton, R. K.

BELCHEERTOWN (Hampshire).
Eliot, H. W.

BELLINGHAM (Norfolk).

BELMONT (Middlesex South).
(See also: Waverley.)
†Dow, J. A.
Grant, W. H.
Hanson, W. C.
Rogers, M. H.
†Underwood, G. L.

BERLIN (Worcester).

BERNARDSTON (Franklin).
Croft, B. P.
Pierce, W. H.

BEVERLY (Essex South).
Chamberlain, M. E.
Cowles, F. A.
Dexter, Franklin
Emery, W. E.
Haddock, C. W.
Hayes, W. F.
Hill, G. J.
Johnson, P. P.
Phillips, C. H.

BEVERLY (continued).

Sears, H. E.
Shatswell, J. A.
Stanley, F. G.
Stickney, G. A.
Stone, R. E.
Swan, L. C.
†Swasey, O. F.
†Torrey, S. W.
Voss, J. W.

Beverly Farms (BEVERLY).

Murphy, D. F.

BILLERICA (Middlesex North).

Buck, M. A.
Stearns, A. W.

Blackinton (WILLIAMSTOWN).

Galvin, William

BLACKSTONE (Worcester).

Roche, T. F.

BLANDFORD (Hampden).

BOLTON (Worcester).

Bondsville (PALMER).

Smith, W. B. T.

BOSTON (Suffolk).

(See also: East Boston, South Boston, Allston, Brighton, Charlestown, Dorchester, Forest Hills, Hyde Park, Jamaica Plain, Mattapan, Roslindale, Roxbury, West Roxbury.)

Achorn, R. C.
Adams, J. D.
Allard, C. E.
Allen, Freeman
Allen, G. W.
Amadon, A. F.
Ames, J. L.
Andrews, A. J.
Andrews, H. V.
Appleton, William
Arkin, Louis
Arnold, H. D.
Austin, A. E.
Ayer, J. B.
Ayer, S. H.
Badger, G. S. C.
Bailey, W. C.
Baker, D. V.
Baker, H. W.
Balboni, G. M.
Balch, F. G.
Barney, J. D.
Barney, W. O.
Barone, Joseph
Barrell, C. S.
Barstow, A. T.
Bartol, J. W.
Bean, C. P.
Beebe, T. C.
Berry, C. F.
Bigelow, W. S.
Binney, Horace
Bisbee, E. S.
Blake, C. J.
Blake, Gerald
Blake, J. B.
Blake, J. G.
†Blodgett, A. N.
Blodgett, J. H.
†Boardman, W. E.
Boardman, W. P.
Boardman, W. S.

BOSTON (continued).

Bonelli, R. P.
Boothby, W. M.
Bossidy, J. C.
Bottomley, J. T.
Bowditch, Harold
Bowditch, V. Y.
Bowen, J. T.
Bowman, F. R.
Brackett, E. G.
Bradford, E. H.
Brady, J. F.
Brant, Austin
Bremer, J. L.
Breslin, J. G.
Brewster, G. W. W.
Briggs, F. M.
Briggs, L. V.
Brigham, F. G.
Brindisi, Rocco
Broderick, T. F.
Brooks, W. A.
Brough, D. D.
†Brown, F. H.
Brown, L. T.
Brown, Percy
Brown, W. J.
Browne, W. E.
Bryant, A. G.
Bryant, John
†Bush, J. S. F.
Buck, H. M.
Buckingham, E. M.
Bullard, W. N.
Burlingham, L. H.
Burnett, F. L.
Burnham, E. A.
Burns, F. S.
Burrage, W. L.
Burt, F. L.
Butler, C. S.
Cabot, Hugh
Cabot, R. C.
Caines, R. J. R.
Call, E. L.
Carley, M. E.
Castleman, Philip
Chadbourne, A. P.
Chandler, T. E.
Chase, H. M.
Chase, W. G.
Cheever, David
Chenery, W. E.
Christian, H. A.
Chute, A. L.
Clap, E. W.
Clark, G. O.
Clark, J. P.
Clark-MacLeod, Emil
Cliff, L. A.
Clymer, George
Cobb, Farrar
Cobb, F. C.
Cobb, G. N.
Cochrane, R. C.
Codman, E. A.
Coffin, R. A.
Cogan, J. A.
Colburn, H. H.
Conant, W. M.
Corlat, I. H.
Coté, H. J.
Cotton, F. J.
Counes, W. P.
Councilman, W. T.
Courie, W. F.
Coursey, F. R.
Courtney, J. W.
Cowles, W. L.
Cox, A. C.

BOSTON (continued).

Cox, O. F.
Cragin, G. A.
Crandon, L. R. G.
Crane, Clarence
Crawford, F. X.
Crockett, E. A.
Crosbie, A. H.
Culbertson, E. V. P. B.
Cummin, J. W.
Cummings, L. J.
Cunningham, A. R.
Cunningham, J. H., Jr.
Cushing, H. W.
Cutler, E. G.
Cutler, G. D.
Daly, W. J.
Daniels, E. A.
Davenport, F. H.
Davis, F. A.
Davis, Lincoln
Davis, M. F.
Dawson, R. P.
Day, H. F.
DeBlois, T. A.
Delano, Samuel
Denig, B. A.
Denny, G. P.
DeNormandie, R. L.
Derby, G. S.
Dewing, L. A.
Dixon, L. S.
Dixon, R. B.
Dodd, W. J.
Dodge, A. M.
Dodge, W. W.
Donlan, C. E.
Donoghue, F. D.
Dorcey, J. E.
Dowling, J. J.
Drury, D. W.
Duckering, F. W.
Dunn, C. H.
Dunn, Wm. Aloysius
Dunn, Wm. Ambrose
Dwight, E. W.
Eames, G. F.
Earle, G. H.
Easton, E. T.
Eaton, H. B.
Edwards, W. L.
Ehrenfried, Albert
Ehrlich, Henry
Elliot, J. W.
Elliot, R. D.
Ely, T. W.
Emerson, W. R. P.
English, M. J.
Erb, T. C.
Eustis, R. S.
Evans, Albert
Everett, E. E.
Fabyan, Marshal
Fair, R. P.
Farlow, J. W.
Faulkner, W. E.
Felch, C. I.
Felch, G. A.
Felch, L. P.
†Fernald, C. A.
Finkelstein, Harry
Fischbein, Louis
Fitz, G. W.
Fitz, Reginald
Fitzgerald, J. B.
Flagg, Elisha
Floyd, Cleaveland
Foley, T. B.
Fraser, A. McK.
Fraser, Somers
Friedman, Benjamin

BOSTON (continued).

Friedman, Nathan
 Frothingham, Channing, Jr.
 Frye, E. B.
 Gallison, J. M.
 Galloupe, C. W.
 Gannett, W. W.
 Garland, G. M.
 Gay, H. S.
 Gay, W. F.
 George, A. W.
 Germain, H. H.
 Ghoreyeb, A. A. W.
 Gilpatrick, R. H.
 Goddu, L. A. O.
 Golden, Lazarus
 Goldthwait, J. E.
 Goodale, J. L.
 Goodall, H. W.
 Grainger, E. J.
 Granger, F. B.
 Graves, W. P.
 Green, C. M.
 †Green, J. O.
 Green, R. M.
 †Green, S. A.
 Greene, D. C., Jr.
 Greene, E. M.
 Greenough, R. B.
 Haines, Ignatius
 Haley, W. T.
 Hall, G. W.
 Hall, W. D.
 Hamilton, A. J. A.
 Hamilton, A. L.
 Hanscom, R. F.
 Harding, G. F.
 Hare, C. H.
 Harmer, T. W.
 Harrington, T. F.
 Harrison, C. W.
 Harrison, Henry
 Hartung, H. H.
 Hartwell, H. F.
 Haskins, F. E.
 Hawes, J. B., 2nd
 Hebbard, E. C.
 Heffernan, D. A.
 Henderson, F. F.
 Hepburn, J. J.
 †Hersey, F. C.
 Hewes, H. F.
 Heydemann, Martin
 Higgins, F. A.
 Hill, G. S.
 Hill, T. C.
 Hitchcock, Edward
 Hogner, R. P. F.
 Hollings, Byam
 Holmes, E. M.
 Hornor, A. A.
 Houghton, N. H.
 Howard, A. G.
 Howe, O. T.
 Howe, W. C.
 Howland, J. B.
 Hubbard, J. C.
 Hughes, L. A. C.
 Hunt, D. L.
 Huntington, J. L.
 Hurley, J. J.
 Hurwitz, A. J.
 Hutchins, H. T.
 Irving, F. C.
 Jack, E. E.
 Jack, F. L.
 Jackson, D. L.
 Jackson, Henry
 Jackson, J. M.
 Janes, A. P.

BOSTON (continued).

Jantzen, F. T.
 Jelly, A. C.
 Johnson, F. M.
 Johnson, F. W.
 Jones, D. F.
 Jones, M. S.
 Jordan, E. M.
 Joslin, E. P.
 Katsinos, G. M.
 Keenan, G. F.
 Kellogg, E. B.
 Kellogg, F. L.
 Kellogg, F. S.
 Kennedy, A. G.
 Kepler, C. O.
 Kerr, I. D.
 Kilburn, H. W.
 Kimpton, A. R.
 King, F. A.
 Kiscock, R. J.
 Knapp, P. C.
 Knowlton, W. M.
 Ladd, Maynard
 Ladd, W. E.
 Lahey, F. H.
 Larrabee, R. C.
 †Lawrence, R. M.
 Leavitt, P. S.
 Lee, H. J.
 Leen, T. F.
 Legg, A. T.
 Leland, G. A.
 Leland, G. A., Jr.
 L'Esperance, O. R. T.
 Levins, N. N.
 Lindquist, C. A.
 †Lithgow, R. A. D.
 Little, J. M., Jr.
 Lloyd, H. D.
 Locke, E. A.
 Loder, H. B.
 Lord, F. T.
 Lothrop, H. A.
 Lothrop, O. A.
 Lovett, R. W.
 Lowell, F. L.
 Luce, LeR. A.
 Lund, F. B.
 Lyman, Henry
 MacAusland, A. R.
 MacAusland, W. R.
 MacCallum, W. P.
 McClintock, F. B.
 MacCormick, J. A.
 McCurdy, T. E. A.
 McDonald, S. J.
 MacKnight, W. F.
 McLaughlin, A. J.
 MacLennan, A. D.
 McWeeny, B. M.
 Madden, W. D.
 Magrath, G. B.
 Mahoney, D. F.
 Marble, H. C.
 Marcy, H. O.
 Martin, J. F.
 Martin, Miles
 Mason, N. R.
 Mead, L. G.
 Means, J. H.
 Medalia, L. S.
 Metcalf, Richard
 Miller, G. F.
 Miller, R. H.
 Minot, G. R.
 Minot, J. J.
 Mixer, C. G.
 Mixer, S. J.
 Mixer, W. J.

BOSTON (continued).

Monks, G. H.
 Moore, G. C.
 Moore, J. H.
 Morgan, C. R.
 Morgan, John
 Morong, A. B.
 Morse, G. W.
 Morse, H. L.
 Morse, J. L.
 Mosher, H. P.
 Murphy, F. C.
 Murray, B. F.
 Myers, S. W.
 Nagle, E. W.
 Newell, F. S.
 †Nichols, A. H.
 Nichols, E. H.
 Nishan, H. M.
 Nolen, W. F.
 Naves, M. L.
 Nute, A. J.
 Oliver, E. L.
 †Oliver, H. K.
 O'Neil, R. F.
 Osgood, R. B.
 O'Sullivan, Anna
 Otis, E. O.
 Otis, W. J.
 Ott, G. J.
 Overlander, C. L.
 Packard, A. E.
 Packard, Horace
 Page, A. K.
 Page, C. G.
 Paine, A. K.
 Palfrey, F. W.
 Palmer, Ezra
 Palmer, S. E.
 Palmer, W. W.
 Parker, W. S.
 Parks, E. L.
 Paul, L. G.
 Paul, W. E.
 Payne, J. H.
 Pearl, S. M.
 Pease, E. A.
 Pemberton, F. A.
 Penhallow, D. P.
 Percy, K. G.
 Perry, H. J.
 Phaneuf, L. E.
 Phelps, J. S.
 Phipps, Cadis
 Pike, W. C.
 Piper, Frank
 Place, E. H.
 Poirier, G. H.
 Pomeroy, H. S.
 Pond, B. W.
 Pope, E. F.
 Porter, C. A.
 Post, Abner
 Powers, G. H.
 Praino, Gaetano
 Preble, W. E.
 Prens, Joseph
 Prince, Morton
 Putnam, J. J.
 Quackenboss, Alexander
 Rabe, E. R. E.
 Reardon, T. J.
 Reggio, A. W.
 Reynolds, Edward
 Rice, W. H.
 Richards, G. G.
 †Richards, G. E.
 Richardson, A. G.
 Richardson, E. P.
 Richardson, Oscar
 Richardson, W. L.

BOSTON (continued).

Riley, Augustus
 Riley, E. A.
 Risley, E. H.
 Robbins, E. D.
 Robbins, W. B.
 Robey, W. H., Jr.
 Rogers, A. E.
 Rolfe, W. A.
 Rosen, D. W.
 Rothblatt, H. L.
 †Rowe, G. H. M.
 Sabine, J. D. K.
 Sadler, R. A.
 Sanborn, G. P.
 Sargent, G. A.
 Sawyer, E. K.
 Scannell, D. D.
 Schirmer, J. W.
 Scott, N. McL.
 Scudder, C. L.
 Sears, G. G.
 Sears, H. F.
 Seymour, Malcolm
 Shapira, A. A.
 Shattuck, F. C.
 Shattuck, G. B.
 Shattuck, G. C.
 Shaw, Albert J.
 Shaw, Arthur J.
 Shea, T. B.
 Sheldon, R. F.
 Simmons, C. C.
 †Skinner, E. M.
 Slack, F. H.
 Smith, Conrad
 Smith, C. M.
 Smith, E. W.
 Smith, G. C.
 Smith, G. G.
 Smith, H. H.
 Smith, M. A.
 Smith, P. M.
 Smith, R. M.
 Smith, W. H.
 Sobotky, Irving
 Soutter, Robert
 Spooner, L. H.
 Sprague, F. P.
 Sprague, R. B.
 Stacey, C. F.
 Standish, Myles
 Stedman, George
 Stevens, W. S.
 Stone, A. K.
 Stone, C. S.
 Stone, J. S.
 Storer, Malcolm
 Streeter, C. E.
 Strong, R. P.
 Stuart, J. H.
 Sullivan, C. B.
 Sumner, P. S.
 Supple, E. A.
 Swain, H. T.
 Swift, E. H.
 Swift, J. B.
 Swift, W. B.
 Talbot, F. B.
 Taylor, E. W.
 Temple, W. F.
 Temple, W. F., Jr.
 Ten Broeck, Carl
 Tenney, Benjamin
 Thomas, J. J.
 Thompson, C. O.
 Thompson, P. H.
 Thorndike, Augustus
 Thorndike, Paul
 Thorndike, T. W.
 Thornton, J. B.

BOSTON (continued).

Tingley, L. P.
 Titus, R. S.
 Tobey, G. L., Jr.
 Torbert, J. R.
 Towle, H. P.
 Townsend, C. W.
 Traves, W. H., Jr.
 †Trull, W. B.
 Twombly, E. L.
 Tyrode, M. P. O. V.
 Verhoeff, F. H.
 Vickery, H. F.
 Victor, A. C.
 Vincent, Beth
 Vose, R. H.
 Wadsworth, R. G.
 Walker, D. H.
 Walsh, E. F.
 Walton, G. L.
 Wardwell, J. K.
 Warren, John
 Warren, J. Collins
 Washburn, F. A.
 Washburn, G. H.
 Waterman, G. H.
 Watson, F. S.
 Watson, J. W.
 Webster, G. A.
 Wells, C. E.
 Wells, Frank
 Wentworth, A. H.
 Wentworth, M. H.
 Wheel, H. R.
 Whipple, F. H.
 White, C. J.
 White, F. W.
 †White, J. C.
 Whitney, C. M.
 Whitney, W. F.
 Whittemore, Wyman
 Wilinsky, C. F.
 Williams, D. L.
 Williams, F. H.
 Williams, Harold
 Williams, H. C.
 Williams, Hugh
 Williams, J. T.
 Wilson, E. W.
 Winslow, F. B.
 Withington, C. F.
 Wolbach, S. B.
 Wood, N. K.
 Woodbury, W. R.
 Wright, J. H.
 Wylie-Cushman, E. R.
 Wyman, E. T.
 Young, E. L., Jr.
 Young, E. B.
 Young, E. W.

BOURNE (Barnstable).

(See also: Cataumet, Sagamore.)

BOXBOROUGH (Middlesex North).

BOXFORD (Essex North).

BOYLSTON (Worcester).

Balcom, K. I.

Bradford (HAVERHILL).

Anthony, F. W.
 Atwood, G. M.
 Brainerd, W. S.
 George, L. H.
 Littlefield, M. C.
 O'Toole, J. L.

BRAINTREE (Norfolk South).

(See also: South Braintree.)

Cook, J. W.
 Dearing, H. L.
 Glie, F. H., Jr.
 Gould, C. H.

BREWSTER (Barnstable).

Crocker, L. A.

BRIDGEWATER (Plymouth).

(See also: State Farm.)

Carr, A. W.
 Hunt, W. E.
 †Pratt, Calvin
 Warren, F. L.
 Whelan, E. V.

Brighton (Middlesex South).

(BOSTON).

(See also: Allston.)

Buckley, W. S.
 Crosby, W. H.
 Gwinnell, A. W.
 Larrabee, F. W.
 Rice, F. W.
 Rowen, H. S.
 Stanton, Joseph
 Tinkham, O. G.

BRIMFIELD (Hampden).

Sawin, R. V.

BROCKTON (Plymouth).

(See also: Campello.)

Alfred, James
 Bacon, J. E.
 Barrett, M. F.
 Beals, A. L.
 Boucher, G. H.
 Brady, J. E.
 Brides, A. E.
 Buckley, G. A.
 Burnett, F. H.
 Callahan, J. F.
 Chase, H. A.
 †Clark, E. W.
 Cloudman, H. R.
 Condrick, J. J.
 Constans, F. E.
 Dacy, C. J.
 Drohan, J. H.
 Ducey, W. D.
 Fullerton, W. W.
 Goddard, H. E.
 Goddard, S. W.
 Gruver, S. J.
 Keith, W. C.
 Lawrence, J. H.
 LeMay, A. M.
 Lupien, H. J.
 Lyon, A. V.
 McCann, C. D.
 McCarthy, T. H.
 McNamara, J. J.
 Mara, J. L.
 Miles, C. G.
 Millet, C. S.
 Moore, G. A.
 Murdock, F. W.
 Naves, J. R.
 O'Brien, F. W.
 Packard, L. E.
 Paine, A. E.
 Pettey, J. A.
 Ripley, F. J.
 †Robinson, L. M.
 Safford, W. P.
 Shaw, J. P.
 Simmons, F. A.
 Smith, A. C.
 Sullivan, A. J.
 Tuholski, D. B.

BROOKFIELD (Worcester).

(See also: East Brookfield.)
 Newhall, L. T.
 Sherman, M. H.

BROOKLINE (Norfolk).

(See also: Waban.)

Adams, Z. B.
 Bail, J. W.
 Barnes, H. A.
 Blakely, D. N.
 Blanchard, B. S.
 Boos, W. F.
 Borden, C. R. C.
 Boutwell, H. K.
 Bowditch, H. I.
 Bowker, E. M.
 Brainerd, J. B.
 Brigham, E. H.
 Bufford, J. H.
 Bulfinch, G. G.
 Butler, P. F.
 †Call, Norman
 Casselberry, C. M.
 Channing, Walter
 Chase, H. L.
 Cleaves, F. H.
 Connelly, J. E.
 Coolidge, Algernon
 Cooper, Almon
 Cornwall, A. P.
 Crabtree, E. G.
 Cushing, A. A.
 Cushing, Harvey
 Cutts, H. M.
 Dalton, C. H.
 Dana, H. W.
 Deal, E. E.
 Denny, F. P.
 Dewis, J. W.
 Dreyfus, E. W.
 Ellis, W. R.
 Emerson, F. P.
 Fairbanks, A. W.
 Fallon, J. F.
 Farr, E. L.
 Fay, W. E.
 Francis, C. S.
 Francis, G. H.
 Gilbert, L. W.
 Gilman, C. S.
 Good, F. L.
 Graham, Douglas
 Gregg, Donald
 Hartwell, J. B.
 Hastings, R. W.
 Hatch, R. A.
 Hayes, F. L.
 †Hills, W. B.
 Hinckley, J. W.
 Hixon, E. C.
 Holmes, G. W.
 †Hood, M. G.
 Houghton, S. A.
 Howard, A. A.
 Inglis, H. J.
 Johnson, H. L.
 Johnson, M. W. L.
 Jones, Everett
 Jones, F. E.
 Jones, J. C.
 Kaan, G. W.
 Kennealy, J. H.
 Klekham, C. J.
 Kingman, R. A.
 Kittredge, Joseph
 Lancaster, W. B.
 Lawrence, C. H., Jr.
 Lee, W. T.
 Levy, F. J.
 Liebman, William

BROOKLINE (continued).

Litchfield, W. H.
 Lyle, E. B.
 Mackie, W. C.
 McLaughlin, H. V.
 McMahon, F. J.
 Mallory, F. B.
 Marshall, H. W.
 Metcalf, J. T.
 Parker, H. S.
 Pearce, A. C.
 Powers, H. H.
 Pratt, J. H.
 †Purvis, C. B.
 Rogers, E. A.
 Rosenau, M. J.
 Sabine, G. K.
 Saunders, E. L.
 Shanahan, T. J.
 Sibley, B. E.
 Smyth, D. C.
 Smyth, P. S.
 Spalding, F. M.
 Spear, L. M.
 Stedman, H. R.
 Toohey, T. V.
 Torney, G. H.
 †Webber, S. G.
 Whittier, F. F.
 Wilcox, De W. G.
 Williams, A. G.
 Williams, F. P.
 Woods, J. H.
 Young, J. F.

Bryantville (PEMBROKE).

Charles, O. W.

BUCKLAND (Franklin).

BURLINGTON (Middlesex East).

CAMBRIDGE (Middlesex South).

(See also: East Cambridge.)

Adams, C. W.
 Anderson, V. V.
 Andrews, R. E.
 Ash, J. E.
 August, Albert
 Bacon, N. S.
 Bailey, M. H.
 Barnes, F. J.
 Boyle, J. J.
 Brassil, T. F.
 Bresnihan, F. S.
 Brousseau, W. G.
 Brown, C. P.
 Bryant, L. L.
 Bucholz, C. H.
 Buehler, G. V. B.
 Burke, W. H., Jr.
 Cady, F. B. M.
 Cahill, C. S.
 Cannon, W. B.
 Clarke, Genevieve
 Clarke, I. L.
 Cleary, James
 Cogswell, G. P.
 Crocker, J. M.
 Cronin, H. J.
 Cunningham, J. H.
 Cunningham, T. E.
 Cunningham, T. E., Jr.
 Currie, J. Z.
 Darling, E. A.
 Davis, B. D.
 Dearborn, G. V. N.
 Derby, W. P.
 Donahue, W. F.
 Dow, D. C.
 Downing, A. F.
 †Driver, S. W.

CAMBRIDGE (continued).

Dudley, A. W.
 Dunham, A. F.
 Dwyer, J. E.
 Dwyer, J. E., Jr.
 Dwyer, W. J.
 †Ela, Walter
 Feeley, C. P.
 Feeley, W. C.
 Finnigan, P. J.
 Fleet, W. E.
 Fleming, P. J.
 Foster, C. C.
 Funnell, W. G.
 Gardner, H. M.
 Goodridge, F. J.
 Greene, J. A.
 Hapgood, L. S.
 Hayes, W. L.
 Heaton, T. H.
 Hinton, W. A.
 Honeil, J. A.
 Hutchinson, C. M.
 Jouett, F. R.
 Kelleher, P. F.
 Kennelly, J. G.
 King, M. L.
 LaMarche, W. J.
 Lancaster, S. R.
 Langnecker, H. L.
 Lee, R. I.
 Lockhart, J. S.
 MacKillop, Daniel
 Mackechnie, A. N.
 McAdams, P. S.
 McCarthy, E. A.
 McGirr, F. F.
 McIntire, G. F.
 McIntire, H. B.
 McKenzie, J. R.
 Murphy, J. J.
 Myles, L. T.
 Nason, O. C. B.
 Nelligan, J. P.
 Nelson, C. A.
 Noonan, W. A.
 Norris, A. P.
 Norton, G. E.
 O'Rourke, E. J.
 Page, G. T.
 Palmer, G. M.
 Partridge, T. J.
 Peirce, B. H.
 Potter, A. C.
 Preble, Wallace
 Putnam, W. A.
 Quennell, W. L.
 Robb, Hunter
 Robertson, J. W.
 Rose, W. M.
 Seavy, H. L.
 Sennott, J. R.
 Sever, J. W.
 Shannon, N. V.
 Simonds, F. A.
 Smillie, W. G.
 Smith, J. J.
 Somers, J. E.
 Southard, E. E.
 Southard, M. A.
 Stevens, E. H.
 Stevens, H. P.
 Sullivan, F. A.
 Swan, W. D.
 Taylor, F. W.
 Thomas, C. H.
 Thomas, W. K. S.
 Thompson, J. S.
 Tibbetts, G. D.
 Trainor, J. A.
 Tuttle, A. H.

CAMBRIDGE (continued).

Verde, Luigi
Walcott, H. P.
†Walker, A. C.
Walsh, C. J.
Wetherbee, Roswell
White, G. A.
Whittemore, W. S.
Whoriskey, J. J.
Williams, E. R.
Williams, F. E.

Campello (BROCKTON).

Averill, J. H.
Caswell, W. E.
Frost, E. W.
Holmberg, C. L. M.
King, N. C.

CANTON (Norfolk).

Fish, J. E.
Kemp, L. S.
Luce, D. S.
Tenney, W. N.

CARLISLE (Middlesex North).

CARVER (Plymouth).

Cataumet (BOURNE).

Cowles, W. W.

CHARLEMONT (Franklin).

Charlestown (Middlesex South).
(BOSTON).

Brickley, W. J.
†Dearborn, J. G.
Duff, John
Fitzpatrick, J. J.
Flagg, H. H.
Grandison, W. G.
Hammond, W. F.
Hurley, D. J.
Lyons, J. B.
Mazum, F. T. L.
McDermott, J. E.
McDonald, W. J.
McNally, W. J.
Morris, M. A.
O'Brien, J. F.
Patterson, W. F.
Plummer, E. M.
Silva, F. P.
Sprague, R. W.
Wood, N. M.

CHARLTON (Worcester).

CHATHAM (Barnstable).

†Gifford, B. D.

CHELMSFORD (Middlesex North).

(See also: North Chelmsford.)
Howard, Amasa
Scorboria, A. G.

CHELSEA (Suffolk).

†Chipman, W. R.
Cutler, C. N.
Fenwick, G. B.
Guild, E. F.
Kenney, J. E.
Negro, Michele
Putnam, J. M.
Raddin, F. S.

CHESHIRE (Berkshire).

CHESTER (Hampden).

Lanpher, H. A.

CHESTERFIELD (Hampshire).

Chestnut Hill (NEWTON).

Baldwin, H. T.
Briggs, E. C.
Curtis, F. G.
Gay, G. W.

CHICOPEE (Hampden).

(See also: Chicopee Falls, Williamsett.)
Gallagher, J. H. C.

Chicopee Falls (CHICOPEE).

Beauchamp, J. O.
Cooley, A. L.
†Gibbs, L. J.
Mannix, L. E.
Powers, J. T. H.
Shea, M. I.

CHILMARK (Bristol South).

CLARKSBURG (Berkshire).

Cliftondale (SAUGUS).

Danforth, H. A.
Harris, L. W.
Penny, H. T.
Penny, M. M.
Perkins, T. T.

CLINTON (Worcester).

Abbott, C. R.
Bowers, W. P.
Chase, G. L.
French, C. L.
Goodwin, J. J.
Grady, P. A. S.
Grady, T. H.
Kirby, J. R.
MacKay, E. H.
Monahan, J. A.
Morse, I. M.
Tobey, G. L.

Cochituate (FRAMINGHAM).

Sparks, E. E.

COHASSET (Norfolk South).

Hinchliffe, Frederick
Howe, O. H.
Osgood, George

COLRAIN (Franklin).

Cram, J. W.
Mather, J. A.

CONCORD (Middlesex South).

(See also: Concord Junction.)
Cheney, F. E.
Emerson, E. W.
Titcomb, G. E.
Walcott, H. J.

Concord Junction (CONCORD).

Fernald, G. G.
Pickard, I. L.

CONWAY (Franklin).

Cotuit (Barnstable).

Haskins, S. F.

CUMMINGTON (Hampshire).

†Stutson, W. P.
Swanson, A. F.

Cushman (AMHERST).

Fuller, A. H.

DALTON (Berkshire).

MacKay, G. F.
Schofield, W. W.
Sullivan, P. J.

DANA (Worcester).

(See also: North Dana.)

DANVERS (Essex South).

(See also: Hathorne.)
Baldwin, F. W.
Buck, C. L.
Deering, C. F.
Mains, H. L.
Marsh, A. P.
Niles, E. H.
Sparhawk, C. W.

DARTMOUTH (Bristol South).

(See also: South Dartmouth.)

Dedham (Norfolk).

(See also: East Dedham.)
Batchelder, H. G.
Finn, E. W.
Hodgdon, A. H.
Pratt, J. W.
Worthington, A. M.
Young, W. H.

DEERFIELD (Franklin).

(See also: South Deerfield.)
Davis, P. G.
Thorn, E. C.

DENNIS (Barnstable).

(See also: Dennisport, East and West Dennis.)

Dennisport (DENNIS).

Ginn, D. R.

DIGHTON (Bristol North).

Baker, H. B.

Dorchester (Norfolk). (BOSTON).

(See also: Mattapan.)

Abbe, F. R.
Adams, H. W.
Bailey, F. J.
Ballou, A. R.
Barker, W. W.
Batchelder, W. B.
Bliss, G. D.
Bogan, F. L.
Brayton, R. W.
Brearton, E. J.
Brown, F. B.
Butler, J. E.
Carroll, C. C.
Carruth, S. S.
Cavanaugh, C. R.
Ceconi, J. A.
Coffin, A. B.
Costello, J. H.
Crittenden, S. W.
Croke, L. W.
Crossman, F. A.
Crowell, Samuel
Curran, S. F.
Davis, W. H.
Davison, A. H.
Devenny, J. H.
Dewey, C. G.
Dobson, W. M.
Draper, A. L.
Drumney, N. D.
Duckering, W. W.
Eldridge, D. G.
Emery, W. C.
Evans, M. H. A.
Fennessey, J. F.
Freedman, L. M.
Frost, H. P.
Giblin, F. J.
†Gilman, E. A.
Graves, B. A.

Dorchester (continued).

Hallisey, J. E.
 Hammond, W. J.
 Hardwick, E. V.
 Harrington, D. J.
 Harrington, H. L.
 Hawkins, Henry
 Hemeon, F. C.
 Hoit, E. G.
 Johnston, William
 Kelley, J. H. H.
 Kelly, J. M.
 Kendrick, J. T.
 Kent, Bradford
 Kingsley, P. J.
 Lane, J. W.
 Luftig, Jacob
 Macauley, J. A.
 Macdonald, A. A.
 McEvoy, G. A.
 McIntire, David
 McQuade, L. S.
 Mahoney, F. X.
 Mains, C. F.
 Marr, M. L.
 Marr, M. W.
 Martin, H. W.
 Mendelsohn, Louis
 Merrick, R. M.
 Miller, C. H.
 Morrison, Hyman
 Murray, P. J.
 Myrick, H. G.
 Noble, M. G.
 Norton, H. R.
 Nute, Marion
 O'Brien, J. J.
 O'Hare, J. P.
 Parker, W. H.
 Parsons, F. S.
 Parvey, Benjamin
 Peirce, G. A.
 Phillips, W. F.
 Quest, J. F.
 Reilly, J. A.
 Reynolds, H. V.
 Roberts, L. A.
 Rogers, O. F.
 Rogers, O. F., Jr.
 Rood, L. C.
 Scales, R. B.
 Scanlan, M. T.
 Scanlan, T. J.
 Schmidt, R. D.
 Shapira, V. I.
 Sheppard, P. A. E.
 Sherburne, A. E.
 Sleeper, F. W.
 Stack, J. J.
 Starbird, E. P.
 †Stevens, G. B.
 Stone, H. E.
 Sturnick, Max
 Sullivan, J. J.
 Sullivan, J. T.
 Taylor, F. L.
 Thurber, M. T.
 Towle, H. C.
 Treanor, J. P.
 Twitchell, E. T.
 Walton, W. J.
 Watson, F. G.
 Watts, H. F. R.
 White, R. M.
 Williams, Joseph
 Wiseman, J. I.
 Wylie, E. C.

DOUGLAS (Worcester).

(See also: East Douglas.)

DOVER (Norfolk).

Emmons, A. B., 2nd.

*DRACUT (Middlesex North).**DUDLEY (Worcester).**DUNSTABLE (Middlesex North).**DUXBURY (Plymouth).*

Durgin, S. H. (Millbrook P. O.)
 Noyes, N. K.
 Spalding, Roger

East Boston (BOSTON).

Bianco, J. A.
 Bonney, Robert
 Bowen, E. E.
 Bragdon, H. E.
 Campbell, B. F.
 Ensworth, W. H.
 Grainger, W. H.
 Hartnett, E. D.
 Houghton, R. H.
 Hurley, D. B.
 Morrison, W. A.
 Morrison, W. R.
 Myers, Solomon
 O'Brien, E. J.
 O'Keefe, M. W.
 Parks, J. W.
 Sisson, Mitchell
 Tallman, A. L.
 Tilton, F. H.

*East Bridgewater (PLYMOUTH).**East Brookfield (BROOKFIELD).*

Hayward, W. F.

East Cambridge (CAMBRIDGE).

Clancy, W. H.
 Fair, J. F.

East Dedham (DEDHAM).

Drew, F. P.

East Dennis (DENNIS).

Hart, H. B.

East Douglas (DOUGLAS).

†Holbrook, S. P.

East Gardner (GARDNER).

Thompson, C. E.

East Gloucester (GLOUCESTER).

†Eveleth, E. S.

*EASTHAM (Barnstable).**EASTHAMPTON (Hampshire).*

Burke, J. J.
 Cobb, O. W.
 Hiltpold, Werner
 Pond, L. B.
 Williams, E. D.
 Winslow, E. S.

East Longmeadow (LONGMEADOW).

Curtis, H. F.

East Milton (MILTON).

Rowe, C. A.

EASTON (Bristol North).

(See also: North Easton.)

East Taunton (TAUNTON).

Adams, W. C.

East Walpole (WALPOLE).

Coon, G. B.

East Weymouth (WEYMOUTH).

Doucett, F. L.
 Fraser, J. C.
 Libby, J. H.

EDGARTOWN (Bristol South).

Worth, E. P.

*EGREMONT (Berkshire).**ENFIELD (Hampshire).*

Segur, W. B.

ERVING (Franklin).

Johnson, F. E.

ESSEX (Essex South).

Steeves, E. C.

EVERETT (Middlesex South).

Bruce, J. A.
 Conroy, P. J.
 Cornish, S. W.
 Dickinson, G. W.
 Downing, C. H.
 Flett, P. McN.
 Harrington, C. W.
 Jackson, A. A.
 Kearney, H. J.
 McAllester, R. W.
 McQuaid, T. B.
 Morris, R. H.
 Ordway, C. A.
 Rogers, F. A.
 Warren, A. H.
 Whitehill, G. E.
 Young, E. W.

FAIRHAVEN (Bristol South).

Horne, L. W.
 Howes, F. M.

FALL RIVER (Bristol South).

Abbe, A. J.
 Almy, Thomas
 Barré, J. A.
 Blanchette, W. H.
 Blood, G. W.
 †Bowen, S. W.
 Bright, J. C.
 Brown, R. F.
 Buck, A. W.
 Butler, G. E.
 Butler, R. B.
 Butler, W. H.
 Chace, F. A.
 Cone, D. E.
 Connell, A. I.
 Creamer, W. H.
 Crispo, P. T.
 Curry, E. F.
 Dolan, W. A.
 Fennelly, D. J.
 French, R. W.
 Gifford, J. H.
 Gilbert, John
 Gordon, S. M.
 Hicks, G. H.
 Howland, C. A.
 Jackson, O. H.
 Jackson, R. W.
 Kelly, Michael
 Kerrigan, J. J.
 King, G. C.
 Learned, W. T.
 Lewis, A. C.
 Lundy, J. H.
 Lowney, J. F.

FALL RIVER (continued).

MacKnight, A. S.
Macrae, A. C.
Marvell, M. W.
McCarthy, E. A.
McCreery, C. C.
Merritt, S. V.
Normand, J. N.
O'Brien, J. P.
Pritchard, W. P.
Ryder, D. R.
Sandler, Samuel
Simmons, R. H.
Stansfield, C. W.
Sullivan, L. J.
Synan, W. E.
Tennis, M. N.
Trainor, J. B.
Truesdale, P. E.
Wardle, Henry
Warren, T. F.
Wilbur, H. G.
Wright, W. F.

FALMOUTH (Barnstable).

(See also: West Falmouth.)
Dwight, James
Jones, L. C.
Tripp, E. P.

Feeding Hills (AGAWAM).

Hastings, J. W.

Fisherville (GRAFTON).

Charbonneau, N. N.

Fiskdale (STURBRIDGE).

†Rice, A. B.

FITCHBURG (Worcester North).

Baker, L. F.
Barton, J. A.
Burns, R. F.
Cary, B. W.
Chandler, C. L.
Cornforth, H. H.
Donovan, T. R.
Fish, Louis
Fiske, E. L.
Gay, C. B.
Jacques, Hector
Jennings, C. H.
Jones, R. C.
Kearney, J. H.
Killelea, E. V.
Lane, C. R.
Lowell, A. P.
McMurray, F. M.
Mason, A. P.
Miller, E. P.
Morgner, R. A.
Mossman, George
Norton, G. P.
O'Malley, E. F.
Quessey, A. H.
Rice, C. H.
Rice, R. A.
Rodrick, A. F.
Sawyer, W. F.
†Sidney, A. W.
Stimson, J. W.
Thompson, F. H.
Thompson, F. H., Jr.
Tully, E. J.
Woodworth, D. S.

Florence (NORTHAMPTON).

Taylor, Walter.

FLORIDA (Berkshire).

Forest Hills (Norfolk) (BOSTON).

Prescott, W. H.

FOXBOROUGH (Norfolk).

Bragg, F. A.
Carlisle, F. H.
Crocker, B. P.
McPherson, G. E.
Moore, F. P.
Neff, I. H.

FRAMINGHAM (Middlesex South).

(See also: Cohasset, Framingham Center, Saxonville.)

Baldwin, S. O.
Benner, H. O.
Bodwell, W. M.
Glass, James
Harriman, C. E.
Healy, D. L.
Hobbs, E. A.
Jessaman, L. W.
Mills, C. F.
Morrow, W. R.
Owen, A. S.
Palmer, L. M.
Potter, F. W.
Potter, J. C.
St. Clair, A. E.
Spaulding, E. R.
Sullivan, E. A.

Framingham Center (FRAMINGHAM).

Bigelow, E. H.

FRANKLIN (Norfolk).

†Faxon, E. M.
Gallison, A. J.

FREETOWN (Bristol North).

Briggs, C. A.

GARDNER (Worcester North).

(See also: East and West Gardner.)

Andrews, Oren
Bailey, C. H.
Bone, H. D.
Ellam, H. W.
†Greenleaf, J. R.
Kenworthy, M. E.
Lachance, A. P.
Lowell, A. F.
Lundwall, L. S. B.
Paine, H. L.
Poole, L. E.
Pratt, E. A.
Sawyer, E. A.
Smith, W. D.
Underwood, G. B.

GAY HEAD (Bristol South).

GEORGETOWN (Essex North).

Hoyt, E. M.
Root, R. B.
Root, R. R.

GILL (Franklin).

GLOUCESTER (Essex South).

(See also: Annisquam and East Gloucester.)

Burnham, Parker
Carvell, Hanford
Choate, H. H.
Cook, S. P. F.
Egan, J. J.
Finegan, D. J.
†Garland, A. S.
Garland, Roy

GLOUCESTER (continued).

Hallett, E. B.
Hulbard, E. D.
Knowles, J. H.
Logan, F. P. T.
Moore, P. P.
Mooring, S. W.
Morrow, C. H.
Proctor, P. C.
Rowley, William
Torrey, A. S.

GOSHEN (Hampshire).

GOSNOLD (Bristol, North).

GRANBY (Hampshire).

GRAFTON (Worcester).

(See also: Fisherville and North Grafton.)
Guild, F. W.

GRANVILLE (Hampden).

White, C. A.

GREAT BARRINGTON (Berkshire).

(See also: Housatonic.)

Chapin, C. S.
Kennedy, E. A.
Parks, S. H.
Stockwell, E. W.

GREENFIELD (Franklin).

Best, E. G.
Canedy, C. F.
Clark, W. K.
Croft, B. P.
Greenough, C. M.
Howe, H. N.
Johnson, A. E., Jr.
McConnell, D. J.
Millett, F. A.
Stetson, H. G.
Twitchell, G. P.
Zabriskie, F. H.

GREENWICH (Hampshire).

GROTON (Middlesex North).

Kilbourn, A. G.

GROVELAND (Essex North).

Woodbury, L. A.

HADLEY (Hampshire).

Johnson, H. L.
Smith, F. H.

HALIFAX (Plymouth).

HAMILTON (Essex South).

(See also: South Hamilton.)
Corcoran, J. G.

HAMPDEN (Hampden).

HANCOCK (Berkshire).

HANOVER (Plymouth).

Hammond, Charles
†MacMillan, A. L.

HANSON (Plymouth).

HARDWICK (Worcester).

HARVARD (Worcester).

Royal, H. B.

HARWICH (Barnstable).

(See also: West Harwich.)

Handy, H. D.
Kline, G. M.
Miller, P. F.
Smysler, C. J.

Hathorne (DANVERS).
Brewster, D. T., Jr.
Chronquest, A. P.
Lawrey, L. G.
Macdonald, J. B.
Trueman, N. G.

HATFIELD (Hampshire).
†Barton, C. M.
Bonneville, A. J.
Byrne, C. A.

HAVERHILL (Essex North).
(See also: Bradford.)

Archambault, L. M.
Benson, C. S.
Bryant, J. E.
Capeles, T. F.
Carden, C. J.
†Chase, I. E.
Clarke, I. J.
Coffin, F. H.
Cogswell, William
Conner, H. L.
Connor, G. J.
Coon, W. H.
Cooney, M. B.
Cotter, T. F.
Croston, J. F.
Donahue, Hugh
Dunn, C. S.
Durant, C. E.
Ferrin, W. W.
Fitzgerald, J. J.
George, A. P.
Holbrook, C. A.
Holden, W. D.
Hubbell, A. M.
Kaplovitch, Henry
Kelleher, J. E.
Laskey, E. P.
LeGro, L. B.
Macdougall, Duncan
McFee, W. D.
McLaughlin, A. O.
Mindlin, Carl
Mysel, H. A.
Nettle, Paul
Pavrides, S. K.
Perkins, H. B.
Pierce, F. B.
Pitcher, H. F.
Popoff, Constantine
Robinson, W. P.
Ruel, J. A.
Sproull, John
Still, C. W.
Stokes, L. T.
Stone, T. N.
Sullivan, F. A.
Symonds, A. G.
Trull, A. C.
Whitney, G. B.
Whitten, G. E.

HAWLEY (Franklin).

Haydenville (WILLIAMSBURG).
Perry, C. E.
Wheeler, C. H.

HEATH (Franklin).

HINGHAM (Norfolk South).
Day, C. O.
Dorr, C. A.
Morse, A. G.
Peterson, J. A.
Whelan, Charles

HINSDALE (Berkshire).

HOLBROOK (Norfolk South).
Cole, A. J.
Crawford, F. W.
Kennison, F. M.

HOLDEN (Worcester).
Stickney, C. W.
Washburn, F. H.

HOLLAND (Hampden).

HOLLISTON (Middlesex South).
Dodd, J. E.
Haviland, N. C. B.
Heffernan, D. W.
Talbot, J. E.

HOLYOKE (Hampden).

Allen, C. A.
Allen, F. H.
Bagg, E. P., Jr.
Bigelow, J. B.
Bliss, J. L.
Bouvier, C. W.
Brady, W. F.
Brindamour, J. E.
Carroll, J. J.
Cavanaugh, T. E.
Celce, F. F.
Celce, J. H.
Clark, G. H.
Clarke, L. H.
Cleary, R. E.
Cox, S. C.
Davis, E. M.
Dickson, R. E.
Donoghue, D. F.
Farr, I. H.
Forster, J. F.
Franz, Adolph
Gabler, G. L.
Hanifin, J. F.
Henderson, G. D.
Holyoke, Frank
Hubbard, J. C.
Hunt, A. E. P.
Hunt, G. E.
Hurley, P. E.
Hussey, E. J.
Kilburn, I. N.
Kinne, G. L.
Knowlton, E. A.
Lewandowski, J. M.
Lynch, H. E.
Mahoney, S. A.
McCabe, J. J.
Morrison, R. F.
Potts, J. H.
Rosenbloom, C. W.
Ryan, W. P.
Taylor, G. L.
Teahan, William
Warren, E. D.
Wetherell, A. B.

HOPEDALE (Worcester).

HOPKINTON (Middlesex South).
Playse, L. F.

Housatonic (GREAT BARRINGTON).
Jones, W. W.
Luchsinger, H. W.

HUBBARDSTON (Worcester).
Knowlton, W. T.

HUDSON (Middlesex South).
Breen, J. H.
Hunter, N. McL.

HULL (Norfolk South).
(See also: Allerton.)
Sylvester, C. P.

HUNTINGTON (Hampshire).
Crittenden, G. A.
†Gibbs, L. V.
Mace, C. H.

Hyannis (BARNSTABLE).

Binford, F. A.
Chase, H. B.
Harris, C. E.
Hawes, E. E.

Hyde Park (Norfolk) (BOSTON).

Barnum, F. G.
Baxter, E. H.
Bennett, W. H.
Bryant, C. E.
Carr, P. W.
Ellis, E. K.
O'Connor, J. H.
Stack, C. F.

Indian Orchard (SPRINGFIELD).

Harrington, M. W.
Smith, S. F.
Whitney, E. W.
Whitney, H. M.

Ipswich (Essex South).

Bailey, G. G.
MacArthur, G. E.
McGinley, M. C.

Jamaica Plain (Norfolk) (BOSTON).

Berry, W. C.
Bigelow, A. H.
Bond, S. A.
Bridgman, B. N.
Broderick, F. P.
†Broidrick, J. P.
Broughton, A. N.
Broughton, H. W.
Brown, H. R.
Callahan, H. A.
Collier, L. H. G.
Dane, John
Emerson, N. W.
Emmons, H. M.
Ernst, H. C.
Faunce, C. B., Jr.
Fitz-Simmons, H. J.
Holland, H. T.
Howland, G. L.
Lane, E. B.
Leard, J. S. H.
Leary, O. C.
Leary, Timothy
McCready, L. T.
McKenna, F. P.
McMann, W. H.
Malone, Charles
O'Brien, W. J. L.
O'Keefe, D. T.
Ordway, M. D.
Partington, C. B.
Perry, A. P.
Reid, I. E. R.
Richardson, F. L.
Richardson, M. W.
Robinson, W. H.
Rollins, E. T.
Safford, M. V.
Spear, E. D.
Stedman, J. C.
Stone, J. G.
Turnbull, F. M.
Vickery, L. F.
Woodworth, J. D. R.

KINGSTON (Plymouth).
Holmes, A. B.

LAKEVILLE (Bristol North).
Glidden, E. W., 2d.

LANCASTER (Worcester).
Beckley, C. C.

LANESBOROUGH (Berkshire).
Downing, F. C.

LAWRENCE (Essex North).

†Abbot, S. W.
Allen, G. S.
Bain, J. B.
Bannon, J. H.
Bartley, J. J.
Beely, L. G.
Bier, M. D.
Birmingham, R. M.
Burgess, C. J.
Burnham, J. F.
Bushold, F. G.
Caltri, Constant
Carleton, C. G.
Chesley, A. E.
Cody, H. C.
Conlon, F. A.
Crandall, W. M.
Cregg, F. A.
Cyr, E. E.
Daly, T. J.
Deacy, J. J.
Dearborn, H. F.
Dorgan, J. A.
Dorion, Kinton
Dow, G. W.
Eldam, C. H.
Forster, R. W.
Fuller, E. P.
Grant, V. V.
Hilton, J. J. H.
Hogan, J. A.
Howard, J. F.
Howe, G. P.
Hughes, P. J.
Joyce, T. F.
Kurth, G. E.
Lawlor, E. F.
Lemieux, T. A.
Levek, J. A.
Manahan, H. W.
Massé, J. B.
McAllister, F. D.
McArdle, J. J.
McGauran, M. S.
McKallagat, P. L.
Merrill, W. H.
Moeckel, C. R.
Murphy, T. W.
Nevers, H. H.
Oeser, P. R.
O'Sullivan, J. J.
Redmond, T. H.
Reed, V. A.
Riordan, W. D.
Sargent, G. B.
Sargent, O. F. L.
Schwartz, Myer
Simon, A. L.
Sinclitico, Giuseppe
Siskind, A. L.
Sullivan, M. F.
Sullivan, W. J.
Tiani, Bernardo
Uniac, T. V.
Walch, J. F.

LEE (Berkshire).
Hassett, J. J.
Markham, E. W.

LEICESTER (Worcester).
(See also: Rochdale.)
McNeish, Alexander

LENEX (Berkshire).
Carroll, M. J.
Jaques, H. P.

LEOMINSTER (Worcester North).
(See also: North Leominster.)

Bigelow, C. E.
Brigham, C. S.
Currier, W. E.
Hall, H. P.
Nye, H. R.
Pierce, A. H.
Pitcher, H. B.
Shaughnessy, T. A.
Shultis, F. C.
Sweeney, B. P.
Wheeler, A. A.

LEVERETT (Franklin).

LEXINGTON (Middlesex South).
(See also: North Lexington.)

Barnes, W. L.
Piper, F. S.
Smithwick, M. P.
Tilton, J. O.
Tyler, W. M.
Valentine, H. C.

LEYDEN (Franklin).

LINCOLN (Middlesex South).
(See also: South Lincoln.)
Loring, R. G.

LITTLETON (Middlesex North).

LONGMEADOW (Hampden).
(See also: East Longmeadow.)

LOWELL (Middlesex North).

Alling, M. L.
Baker, C. S.
Bellehumeur, D. S.
Benner, B. R.
Bertrand, A. E.
Blanchard, P. D.
Boyle, J. F.
Brady, C. N.
Brady, F. R.
Brunelle, Pierre
Bryant, M. D.
Caisse, G. E.
Carroll, T. F.
Cassidy, J. J.
Clark, E. J.
Coburn, H. F.
Collins, W. M.
Denzett, A. G.
Eaton, W. G.
Ellison, D. J.
Finnegan, F. A.
Fishman, Maurice
French, C. E.
Gage, F. L.
Gage, J. A.
Gardner, A. R.
Giguere, A. J.
Halloran, T. J.
Halpin, A. J.
†Huntress, Leonard
Jackson, W. B.
Johnson, J. B. A.
Johnson, W. A.
Jones, R. LeR.
Jones, W. M.
Kearney, J. P.
Lambert, J. H.

LOWELL (continued).

Lamoureux, J. E.
†Lathrop, W. H.
Lavalée, G. O.
†La Vigne, A. W.
Lawler, W. P.
Leahy, G. H. A.
Livingston, C. B.
Livingston, E. G.
Loughran, J. F.
Mahoney, M. P.
Mahoney, F. R.
McAdams, J. P.
McCarty, J. J.
McCluskey, R. J.
McGannon, T. G.
Meehan, P. J.
Mehan, J. A.
Meigs, J. V.
Meigs, R. J.
Mignault, Rodrigue
Murphy, E. M.
Murphy, F. P.
O'Conner, J. B.
†Parker, M. G.
Parker, R. W.
Perkins, R. S.
Pillsbury, B. H.
Pillsbury, F. F.
Pillsbury, G. H.
Plunkett, H. B.
Pulsifer, Nathan
Robertson, E. A.
Rodger, J. V.
Rogers, J. A.
Roughan, C. M.
Ryan, W. F.
†Sanders, C. B.
Shaw, A. E.
†Shaw, T. P.
Simpson, C. E.
Smith, F. H.
Smith, T. B.
Stewart, R. C.
Sullivan, J. F.
Sumner, H. H.
Sweetsir, C. L.
Tighe, M. A.
Viles, C. A.
Welch, E. J.
Wilson, C. D.
Young-Slaughter, E. E.

LUDLOW (Hampden).
Hoyt, P. A.

LUNENBURG (Worcester North).
Woods, C. E.

LYNN (Essex South).

Abbott, H. E.
†Ahearne, C. A.
Allen, G. E.
Bangs, C. H.
Bedard, J. A.
Bennett, H. P.
Berg, T. A. J.
Bixby, O. E.
Blair, O. C.
Blaisdell, J. H.
Bowen, A. P.
Breed, N. P.
Burrows, M. C.
Butts, W. L.
Carr, G. L.
Chicoine, I. H.
Clarke, H. C.
Cobb, C. M.
Darling, A. E.
Davis, H. L.

LYNN (continued).

Davis, S. R.
 Degell, F. B.
 De Langie, C. P.
 Dennison, A. S.
 Devlin, P. C.
 Donovan, M. R.
 Fraser, W. L.
 Garipay, E. P.
 Grady, T. F.
 Grant, J. H.
 Gray, G. H.
 Hagopian, L. G.
 Harriman, Perley
 Harris, A. E.
 Harris, W. DeB.
 Hartman, Gustave
 Hassett, L. W.
 Hawes, A. T.
 Hearn, W. L.
 Hennessey, T. F.
 Hoitt, C. L.
 Hopkins, W. T.
 Jenkins, C. E.
 Johnson, H. A.
 Jones, E. W.
 Jones, J. A.
 Joslyn, A. E.
 Judkins, C. L. M.
 Judkins, F. L.
 Kirkpatrick, G. H.
 Lane, F. A. (East Lynn)
 Lemaire, W. F. (East Lynn)
 Limauro, L. H.
 Little, W. B.
 Lougee, F. T.
 Lougee, G. W.
 Lovejoy, C. A.
 Lovell, C. D. S.
 Lyons, G. A.
 McIntire, F. G.
 McLennan, W. E.
 MacRobbie, Alexander
 Mangan, J. J.
 Manix, E. T.
 Marshall, W. R.
 Martel, Stanislaus
 Martin, A. H.
 Martin, J. B.
 Mathes, R. W.
 Merrill, E. A.
 Metzger, Butler
 Morse, F. A.
 Munroe, H. B.
 Nathanson, E. S.
 Newhall, A. L.
 Newhall, H. F.
 Newhall, H. W.
 O'Keefe, E. S.
 O'Reilly, W. F.
 O'Shea, J. F.
 Pinkham, J. G.
 Rich, C. E.
 Richardson, B. F.
 Robins, S. A.
 Ruppel, C. E. F.
 Ruppel, M. D.
 Sheldon, C. C.
 Shepherd, W. G.
 Smith, M. C.
 Stockbridge, A. H.
 Stone, C. E.
 Stone, F. E.
 Trask, J. W.
 Tucker, A. W.
 Underhill, S. G.
 Wainshel, P. W.
 Ward, W. G.
 White, Everett
 White, J. R.
 Worthen, C. A.

LYNNFIELD (Essex South).
Freeman, F. W.

MALDEN (Middlesex South).

Barron, E. W.
 Brown, R. N.
 Bychower, Victor
 Clarke, M. E.
 Clarke, W. E.
 Conley, B. F.
 Corbett, J. J.
 Cummings, M. E.
 Deal, G. F.
 Fales, A. C.
 Gallagher, N. A.
 Gay, F. W.
 †Goodwin, R. J. P.
 Griffin, A. G.
 Hartwell, W. W.
 Hoberman, Samuel
 Hunt, W. E.
 Johnson, H. S.
 Jones, C. D.
 Kingsbury, W. W.
 Konikow-Bucholz, A. F.
 Lawrence, J. W.
 Lougee, W. W.
 MacDonald, W. C.
 MacMichael, E. H.
 MacNeil, S. S. J.
 McBain, W. H.
 McCarthy, C. D.
 McCarthy, L. F.
 †Norris, A. L.
 Pavlo, S. G.
 Plummer, F. J.
 Plummer, F. W.
 Prior, C. E.
 Proctor, J. W.
 Ryder, Godfrey
 Smith, W. F.
 Staples, C. H.
 Stevens, A. J.
 Thomas, C. L.
 Thompson, R. H.
 Watts, H. A.

Manchaug (Sutton).
Couillard, P. L.MANCHESTER (Essex South).
Blaisdell, G. W.
Glendenning, R. T.

MANSFIELD (Bristol North).

Allen, W. H.
 Cook, J. W.
 Dunbar, F. H.
 Latham, B. M.
 Spaulding, J. D.

MARBLEHEAD (Essex South).

Eveleth, S. C.
 Greenwood, A. M.
 Hall, H. J.
 Ireson, F. R.
 Sanborn, P. L.

MARION (Bristol South).
Cobb, A. C.
Dunham, H. B.

MARLBOROUGH (Middlesex South).

Chalmers, H. E.
 McCarthy, T. F.
 Reilly, T. E.
 Robinson, H. A.
 Stevens, R. E.
 Warner, C. T.

MARSHFIELD (Plymouth).
Bartlett, C. W.

Marshfield Hills (MARSHFIELD).

Davis, G. R.
 Strong, S. L.

MASHPEE (Barnstable).

Mattapan (Norfolk) (BOSTON).

Behrman, R. A.
 Cheever, A. J.
 Cheever, C. A.
 Fleming, P. J.
 Grover, J. I.
 Guild, T. E.
 Kelley, R. E. S.
 McCarthy, F. P.
 Morse, N. N.
 Noble, E. C.
 St. Denis, J. N.
 Scannell, J. J.
 Stearns, R. T.
 White, A. J.
 Winchester, G. W.

MATTAPOISETT (Bristol South),
Blaine, W. E.
Tilden, I. N.MAYNARD (Middlesex South).
Hamblen, HowardMEDFIELD (Norfolk).
Mitchell, ArthurMEDFORD (Middlesex South).
(See also: West Medford.)

Barrett, E. W.
 Burke, W. T.
 Burrell, H. C.
 Chandler, N. F.
 Clark, J. C. D.
 Clark, M. W.
 Donnell, H. A.
 Fleming, E. R.
 Gahan, P. F.
 Guthrie, A. D.
 Hipkiss, George
 Isley, F. R.
 Killam, F. H.
 MacKinnon, O. L.
 Sise, L. F.

MEDWAY (Norfolk).
(See also: West Medway.)
Yeaton, G. W.MELROSE (Middlesex East).
(See also: Melrose Highlands.)

†Clark, J. S.
 Fay, J. H.
 Fish, E. C.
 Jack, E. S.
 Jackson, H. B.
 Leonard, R. D.
 Marr, E. L.
 Perley, R. D.
 Pike, F. F.
 Raynes, M. B.
 Sims, F. R.
 Small, A. E.
 Stratton, R. R.

Melrose Highlands (MELROSE).

Gage, A. T.
 Harlow, C. W.
 Provandie, P. H.

MENDON (Worcester).

MERRIMAC (Essex North).
Sweetsir, F. E.

- METHUEN (Essex North).**
Bakel, R. V.
Cushman, H. L.
Cutter, A. H.
Lawlor, R. H.
Parr, John
- MIDDLEBOROUGH (Bristol North).**
Coolidge, Sumner
Elliott, Alfred
†Ellis, G. L.
Holmes, D. H.
- MIDDLEFIELD (Hampshire).**
- MIDDLETON (Essex South).**
Ewing, G. W.
- MILFORD (Worcester).**
French, J. M.
Keith, H. L.
Knight, M. W.
Lally, F. H.
- MILLBURY (Worcester).**
Brown, A. A.
Church, C. A.
Hurd, A. G.
Lincoln, J. R.
- Miller's Falls (MONTAGUE).*
Cudworth, C. D.
- MILLIS (Norfolk).**
- MILTON (Norfolk).**
(See also: East Milton.)
Bartol, E. F. W.
Edsall, D. L.
Forbes, Alexander
Kite, W. C.
Lane, W. A.
Pierce, G. B.
Pierce, M. V.
Rackemann, F. M.
Williams, C. H.
- Mittineague (WEST SPRINGFIELD).*
Downey, H. A.
- MONBOE (Franklin).**
- MONSON (Hampden).**
Ellis, F. W.
Jackson, C. W.
King, G. E.
Thom, D. A.
- MONTAGUE (Franklin).**
(See also: Miller's and Turner's Falls.)
Cooke, G. A.
- MONTEREY (Berkshire).**
- MONTGOMERY (Hampden).**
- MOUNT WASHINGTON (Berkshire).**
- NAHANT (Essex South).**
Cusick, L. F.
- NANTUCKET (Bristol South).**
Grouard, J. S.
Lewis, F. E.
- NATICK (Middlesex South).**
(See also: South Natick.)
Bancroft, G. A.
Baum, E. G.
Burke, M. F.
Cochran, W. J.
Cook, C. H.
Sylvester, W. H.
Walcott, W. W.
- NEEDHAM (Norfolk).**
(See also: Needham Highlands.)
Coppinger, S. E.
DeLue, F. S.
†Kingsbury, A. D.
†Mansfield, H. T.
Parker, F. D.
Pease, C. W.
Webber, W. G.
- Needham Highlands (NEEDHAM).*
Mitchell, William
- NEW BEDFORD (Bristol South).**
Allen, H. C.
Atchison, C. M.
Bonnar, J. M.
Bonney, C. A., Jr.
Brunelle, A. L.
Bullard, J. T.
Burt, C. E.
Canney, E. R.
Cody, E. F.
Connor, C. F.
Croacher, A. W.
Dehn, E. W.
Donovan, S. E.
Foster, E. E.
Fraser, J. A.
Gardner, E. D.
Grochinsky, Herman
Hathaway, J. G.
Hayes, S. W.
Hough, G. de N.
Hudnut, F. J.
Johnson, E. St. J.
Kirby, H. C.
La Riviere, E. G.
Leary, C. J.
Lowney, D. J.
Mandell, A. H.
Marsden, George
Mathewson, F. W.
Moncrieff, W. A.
†Nickerson, W. J.
Nield, W. A.
Nietsch, W. E. L.
O'Brien, D. P.
O'Connor, P. H.
Paquin, J. U.
Pearce, G. G.
Perras, L. A.
Perry, H. E.
Peterson, C. A. B.
Pitta, J. C. da S.
Pothier, J. C.
Potter, L. F.
Pratt, C. A.
Pratt, D. D.
†Prescott, C. D.
Prescott, H. D.
Robbins, E. E.
Robbins, E. S.
Roche, T. N.
St. Germain, J. P.
Salles, J. M.
Seaver, E. P., Jr.
Segall, S. K.
Senesac, A. N.
Shanks, Charles
Stetson, F. E.
Stevens, H. L.
Tavira, A. J.
†Tucker, E. T.
Turner, W. K.
Weaver, H. V.
Weeks, J. F.
Wheeler, E. H.
Whitney, E. M.
Winslow, B. S.
Young, E. W.
- NEW BRAINTREE (Worcester).**
- NEWBURY (Essex North).**
- NEWBURYPORT (Essex North).**
Day, C. C.
Hall, C. F. A.
Hamilton, R. De L.
Healy, T. R.
Hurd, R. C.
Johnson, C. F.
Little, A. N.
Nason, A. C.
Noyes, E. H.
Peter, A. J.
†Pillsbury, W. W.
Shaw, J. W.
Snow, F. W.
Tigh, Frederick
Toppan, R. L.
- NEW MARLBOROUGH (Berkshire).**
- NEW SALEM (Franklin).**
- NEWTON (Middlesex South).**
(See also: Newton Center, Newton Highlands, Newton Upper Falls, Newtonville, West Newton, Auburndale, Chestnut Hill, Waban.)
Abbott, F. H.
Cummings, A. C.
Dempsey, J. E.
†Eddy, G. S.
Gallagher, T. M.
Hopkinton, George
Leary, A. J.
Marcy, H. O., Jr.
Marston, W. W.
Mellus, Edward
Moore, Howard
O'Donnell, F. M.
Painter, C. F.
Pearson, C. L.
Reid, W. D.
Ripley, W. I.
†Stone, L. R.
Stubbs, F. R.
Webber, F. W.
Young, J. H.
- Newton Center (NEWTON).*
Andrews, E. A.
†Crawford, S. M.
Friedman, L. V.
Kirkwood, A. S.
Loring, R. P.
May, G. E.
Sylvester, P. H.
Watters, Henry
West, G. L.
- Newton Highlands (NEWTON).*
Bartlett, P. C.
Brickett, B. H.
Mellen, E. W. A.
Thompson, C. A.
Withee, F. E.
- Newton Upper Falls (NEWTON).*
†Everett, W. S.
McOwen, W. H.
- Newtonville (NEWTON).*
Baker, D. E.
Clark, F. R.
Hunt, H. O.
Hunt, W. O.
Miner, L. M. S.
Thayer, H. W.
†Trow, W. M.
- NORFOLK (Norfolk)**

Norfolk Downs (QUINCY).
Sweeney, M. T.

North Abington (ABINGTON).
Curtin, J. F.
Rand, R. B.
Wheatley, F. E.
Wheatley, F. G.

NORTH ADAMS (Berkshire).
Brown, M. M.
Brown, O. J.
Brown, W. E.
Carpenter, R. J.
Jones, L. A.
Matte, J. H. A.
†Millard, H. J.
Riley, J. H.
Russell, E. E.
Stafford, F. D.
Thompson, G. H.

North Amherst (AMHERST).
Stowell, Joab.

NORTHAMPTON (Hampshire).
(See also: *Florence*.)

Adams, W. H.
Ball, A. N.
Brown, E. W.
Clark, S. A.
Cobb, C. T.
Collins, J. D.
Collins, W. J.
Cooney, M. E.
Copeland, E. H.
Dow, F. E.
Fay, J. M.
Gardner, C. R.
Gilman, Florence
Greene, E. C.
Hanson, J. G.
Hayes, J. E.
Hitchcock, J. S.
Houston, J. A.
Hudnot, P. A.
James, B. F., Jr.
Leeper, M. E.
McCormick, A. H.
Minshall, A. G.
Perry, H. B.
†Seymour, Christopher
Shores, H. T.
Thomas, E. E.

NORTH ANDOVER (Essex North).
Daly, J. J.
Smith, F. S.

NORTH ATTLEBOROUGH (Bristol North).
Carley, F. J.
Gerould, J. B.
Kilby, H. S.
Shoemaker, A. B.
Ward, E. S.

NORTHBOROUGH (Worcester).
†Barnes, H. J.
Stanley, J. M.

NORTHERIDGE (Worcester).
(See also: *Whitinsville*.)

NORTH BROOKFIELD (Worcester).
Phelan, E. F.

North Chelmsford (CHELMSFORD).
Varney, F. E.

North Dana (DANA).
Ellis, A. H.

North Easton (EASTON).
McCabe, F. J.
Porter, R. B.
Stevenson, W. M.

NORTHFIELD (Franklin).
Newton, A. L.
Philbrick, R. H. (East)
Wood, N. P.

North Grafton (GRAFTON).
Clapp, F. H.
Pattrell, A. E.
Smith, W. L.
Stevenson, E. A.

North Lexington (LEXINGTON).
†Webster, J. R.

North Oxford (OXFORD).
Stone, Byron

NORTH READING (Middlesex East).
Averill, C. W.
Burns, N. B.
MacCorison, C. C.

North Weymouth (WEYMOUTH).
Drake, W. A.

North Wilbraham (WILBRAHAM).
Damon, A. L.

NORTON (Bristol North).
Round, A. M.

NORWELL (Plymouth).

NORWOOD (Norfolk).
Field, H. M.
Fogg, I. S.
Gould, C. S.
Hagerty, J. J.
Hartwell, A. S.
Norton, E. C.
Phipps, L. H.
Riemer, H. B. C.

OAKHAM (Worcester).

OAK BLUES (Bristol South).

ORANGE (Franklin).
Maher, H. C.
Smith, H. F. M.
Ten Broeck, S. J.

ORLEANS (Barnstable).
Bense, F. A.

Osterville (BARNSTABLE).
Kinney, D. D'A.

OTIS (Berkshire).

OXFORD (Worcester).
(See also: *North Oxford*.)
Fletcher, R. S.
Woodward, J. R.

PALMER (Hampden).
(See also: *Bondsville*, *Thorndike*
and *Three Rivers*.)

Cleaves, H. F. T.
Flood, Everett
Greene, R. A.
Hodskins, M. B.
Moore, G. A.
Schneider, J. P.

PAXTON (Worcester).

PEABODY (Essex South).
Carroll, H. G.
Foss, R. E.
Foster, H. K.
Hickey, J. J.
Jordan, J. F.
Kelley, L. K.
Kennard, H. D.
Shanahan, John
Tucker, S. C.
Varney, E. M.

PELHAM (Hampshire).

PEMBROKE (Plymouth).
(See also: *Bryantville*.)

PEPPERELL (Middlesex North).
Heald, C. G.
Qua, L. R.

PEBU (Berkshire).

PETERSHAM (Worcester North).

PHILLIPSTON (Worcester North).

PITTSFIELD (Berkshire).

Bartlett, O. L.
Blanchard, R. H.
Burton, S. C.
Colt, Henry
Currier, W. H.
Dodd, I. S. F.
Eisner, M. S.
England, A. C.
Finkelstein, Nathan
Flournoy, Thomas
Flynn, J. J.
Frawley, W. T.
Hennelly, T. P.
Hill, L. R.
Howard, E. H.
Howe, J. D.
Hunt, G. P.
Kelly, W. P.
Lally, W. J.
Langlois, J. A.

†Leavitt, W. W.
Leslie, C. T.
Littlewood, Thomas
Mayberry, F. E.
Mellen, H. G.
Mercer, W. J.
Merrill, A. P.
Messer, E. R.
Paddock, B. W.
Paddock, W. L.
Richardson, C. H.
Roberts, F. A.
Schneider, H. A.
Sullivan, J. A.
Sylvester, A. W.
Taylor, E. H.
Thomes, J. B.
Tracy, W. L.
Walker, M. H., Jr.
Wilder, W. O.
Wilmington, A. B.
Woodruff, R. A.

PLAINFIELD (Hampshire).

PLYMOUTH (Plymouth).

Brown, W. G.
Burns, H. H.
Churchill, J. D.
†Cowles, Edward
Hill, E. D.
Hitchcock, H. R.
Prince, C. O.
Reed, L. B.

PLYMPTON (Plymouth).**PRESCOTT, (Hampshire).****PRINCETON (Worcester).**
Lewis, E. S.**PROVINCETOWN (Barnstable).**Birge, E. F.
Birge, W. S.
Curley, C. F.**QUINCY (Norfolk South).**(See also: Atlantic, Norfolk
Downs, West Quincy, Wollas-
ton.)Ahlstrom, Hjalmer
Blanchard, W. H.
Burke, F. R.
Bushnell, E. H.
Ellsworth, S. W.
Gordon, J. A.
Hardwick, S. C.
Harkins, W. J.
Hunting, N. S.
Jones, F. E.
Lynch, C. J.
McCauley, W. J.
McLeod, J. M.
Middleton, W. J.
Reardon, B. D.
Reynolds, J. T.
Ryder, G. H.
Sargent, W. L.
Sheahan, G. M.**RANDOLPH (Norfolk South).**Granger, F. C.
Higgins, G. V.
Myrick, A. W.**RAYNHAM (Bristol North).****READING (Middlesex East).**Brown, W. J.
Dow, G. F.
Halligan, E. M.
Henderson, C. R.
Marsh, Albert
Richmond, E. D.
Smalley, F. L.**REHOBOTH (Bristol North).****REVERE (Suffolk).**Andrews, F. F.
Bond, W. G.
Cummings, E. F.
Monahan, E. J.
Morris, J. S.
Newton, W. C.
Skirball, L. I.
Walker, William
Walsh, J. E.
Wilkins, G. A.**RICHMOND (Berkshire).****Rochdale (LEICESTER).**Leach, E. M.
†Leach, H. M.**ROCHESTER (Bristol South).****ROCKLAND (Plymouth).**Corey, F. H.
Frame, Joseph
Knight, C. E.
Osgood, Gilman**ROCKPORT (Essex South).**Cleaves, E. E.
Stone, G. A. (Pigeon Cove)
Tupper, A. M.**Roslindale (Norfolk) (BOSTON).**

(See also: Forest Hills.)

Allen, A. N.
Bagnall, E. S.
Beede, M. J.
Blake, J. E.
Ford, J. F.
King, N. J. Q.
Lynch, D. L.
Sawyer, A. R.
Sawyer, E. LeR.
Smith, J. H.
Steele, A. E.
Stevens, Seriah
Whitcombe, C. R.**ROWE (Franklin).****ROWLEY (Essex North).**

Pedrick, S. A.

Roxbury (Norfolk) (BOSTON).Abbe, E. M.
Adams, John
Addelson, Nathan
Adler, H. M.
Alcuzar, Isaac
Ascher, Joseph
Bardwell, F. A.
Barry, J. H.
Bartlett, W. O.
Blake, F. G.
Boehm, J. B.
†Bolles, W. P.
Bradley, C. S.
Breck, Samuel
Bresnahan, J. F.
Brooks, E. M.
Brownrigg, J. S.
Burlingham, L. H.
Callanan, S. A.
Clement, G. W.
Coupal, J. F.
Coyne, T. J.
Cronin, M. J.
Cushing, E. W.
Cushman, G. T.
Daly, B. T.
Darling, C. B.
Davidson, K. M.
Dunbar, F. C.
†Edson, P. O'M.
Emery, W. H.
Fisher, G. G.
Frank, Morris
Galligan, E. T.
Gavin, J. H.
Gerstein, Maurice
Gervais, H. M.
Glunts, David
Goodman, Samuel
Gray, A. M.
Gray, E. T.
Gray, Horace
Greene, T. F.
Greene, W. H.
Grey, E. G.
Hall, J. B., Jr.
Harvey, W. W.
Hermann, O. J.
Hill, L. W.
Hodges, A. D.
Homans, John
Hortax, Gilbert
Howard, H. B.
Howard, M. E. P.**Roxbury (continued).**Johnson, D. J.
Keeler, W. B.
Knowlton, C. D.
Konikow, M. J.
Levine, S. A.
Libby, E. N.
Linenthal, Harry
Littlefield, S. H.
Lockary, J. L.
Macdonald, C. W.
Macdonald, F. C.
Mansfield, J. A.
Martin, Edward
Martin, J. M.
Mason, G. McC.
May, J. S.
McCormick, T. J. H.
McGurn, W. J.
McLaughlin, J. I.
McLeod, J. S.
Millet, J. A. P.
Moore, M. T. V.
†Moran, J. B.
Morrison, A. B.
Murphy, E. T.
Murphy, T. J.
Mysel, Philip
Newburgh, L. H.
Ober, F. R.
O'Brien, T. J.
O'Connor, T. H.
O'Keefe, A. M.
Olin, Harry
Patch, W. T.
Patten, S. K.
Peabody, F. W.
Pigeon, J. C. D.
Powers, E. P.
Richmond, Simon
Rochford, G. E.
Rubin, S. H.
Rushmore, Stephen
Sanborn, J. W.
Schmidt, F. S.
Schorer, C. B. J.
Scott, G. H.
Shay, C. E.
Shay, T. M.
Shulman, D. H.
Snow, F. S.
Solomon, H. C.
Sternberg, J. E.
Stetson, F. W.
Stone, G. H.
Sughrue, D. F.
Sullivan, J. L.
Thayer, Eugene
Towne, E. B.
Turetzky, W. L.
Walker, I. C.
Wernick, B. G.
†Wescott, W. H.
West, E. G.
White, H. W.
White, P. D.
White, W. A.
†Williams, E. T.
Winn, C. H.
Young, R. R.**ROYALSTON (Worcester North).****RUSSELL (Hampden).****RUTLAND (Worcester).**Chamberlain, W. E.
Crane, B. T.
Washburn, Elliott**Sagamore (Bourne).**

Curry, E. F.

SALEM (Essex South).

Ahearn, C. A., Jr.
 Atwood, F. S.
 Blair, G. K.
 Burbeck, E. K.
 Carlton, F. C.
 †Choate, David
 Collins, F. L.
 Curtis, C. L.
 Donaldson, J. F.
 Elliot, H. L.
 Field, M. T.
 Finnegan, P. J.
 Goodell, G. Z.
 Fennessey, W. W.
 Kittredge, Thomas
 LeBoeuf, A. T.
 Lesses, Max
 McDermott, W. V.
 Mansfield, B. B.
 Noyes, W. N.
 Peirson, E. L.
 Perkins, R. S.
 Phippen, Hardy
 Phippen, W. G.
 Poirer, Emile
 Poirer, Horace
 Rappaport, Boris
 Robbins, F. G.
 Rushford, E. A.
 Sargent, A. N.
 Sheehan, W. J.
 †Shreve, O. B.
 Simpson, J. E.
 Sturgis, B. F., Jr.
 Towle, E. D.
 Tucker, G. E.
 Wilson, C. M.

SALISBURY (Essex North).

SANDSFIELD (Berkshire).

SANDWICH (Barnstable).

Beale, S. M., Jr.
 Currier, C. R.
 Procter, T. W.

SAUGUS (Essex South).

(See also: Cliftondale.)
 Gale, G. W. (East)
 Parcher, G. C.

SAVOY (Berkshire).

Saxonville (FRAMINGHAM).

Carr, C. J.

SCITUATE (Plymouth).

(See also: Scituate Center, Scituate Harbor.)

Scituate Center (SCITUATE).

Handy, H. T.

Scituate Harbor (SCITUATE).

Alexander, T. B.

SEEKONK (Bristol North).

SHARON (Norfolk).

Dole, C. F.
 Griffin, W. A.
 McIntosh, Herbert

SHEFFIELD (Berkshire).

Wakefield, A. T.

SHELBURNE (Franklin).

(See also: Shelburne Falls).

Shelburne Falls (SHELBURNE).

†Canedy, F. J.
 Guild, B. T.
 Upton, C. L.

SHERBORN (Middlesex South).

SHIRLEY (Worcester North).

SHREWSBURY (Worcester).

Bliss, W. H.
 Chase, E. L.

SHUTESBURY (Franklin).

SOMERSET (Bristol South).

SOMERVILLE (Middlesex South).

(See also: West Somerville.)

Allison, C. E.
 Bateman, F. E.
 Bell, R. D.
 Bell, W. A.
 Bolton, C. J.
 †Booth, E. C.
 Buffum, H. E.
 Carvill, A. H.
 Carvill, L. M.
 Caswell, B. H.
 Curtis, H. F.
 Dailey, E. J.
 Dervin, L. J.
 Dolan, W. F.
 Durell, T. M.
 Finnerty, C. W.
 Gunter, F. C.
 Haché, H. C.
 Hanscom, Sanford
 Hatchett, W. J.
 Hegerty, J. G.
 Hodgdon, R. F.
 Maguire, C. F.
 Maguire, E. L.
 McCaffrey, C. F.
 McGann, P. P.
 Merrill, A. E.
 Merrill, A. S.
 Meyer, E. J.
 Mills, A. E.
 Mongan, C. E.
 Morse, F. L.
 Newton, E. R.
 Place, R. W.
 Price, O. J.
 Raymond, L. H.
 †Sanborn, E. A.
 Sawin, C. D.
 Sewall, E. F.
 Shanahan, T. J.
 Shaw, Francis
 Smith, F. G.
 Spinney, F. I.
 Stephens, F. N.
 Towle, C. C.
 Trueman, H. S.
 Walker, H. A.
 White, M. W.
 Whiting, G. W. W.
 †Willis, Reuben
 Yenetchi, H. A.

SOUTHAMPTON (Hampshire).

SOUTHBOROUGH (Worcester).

South Boston (BOSTON).

Bancroft, W. B.
 Barnard, B. L.
 Boland, E. S.
 Buckley, P. T.
 Cosby, E. J.
 Cross, W. P.
 Denning, E. J.
 Denning, F. J.
 Devine, W. H.
 Doggett, F. F.
 Fletcher, R. W.
 Gallivan, W. J.
 Hurley, E. D.
 Jakmauh, P. J.
 Keenan, H. J.
 Morris, G. P.
 Morris, J. G.
 Reddy, J. W.
 Redmond, J. W.
 Regan, J. J.
 Rochford, R. A.
 †Ruddick, W. H.
 Ryder, W. I.
 Sheehan, W. J.
 Sheridan, P. E. A.
 Slattery, J. R.
 Stuart, F. W.
 Timmins, E. F.
 Tracy, E. A.
 Tynan, J. F.
 Wickham, T. W.

South Braintree (BRAINTREE).

Dame, F. R.
 Merriam, F. H.
 Sullivan, C. A.

SOUTHERIDGE (Worcester).

Bradford, C. C.
 Cutler, M. F.
 Olin, F. H.
 Page, J. G. E.
 Reed, W. G.
 Waite, L. R.

South Dartmouth (DAETMOUTH).

Cushman, A. B.
 Richards, G. L.

South Deerfield (DEERFIELD).

Suitor, H. A.

South Dennis (DENNIS).

Davis, C. A.

SOUTH HADLEY (Hampshire).

(See also: South Hadley Falls.)
 Lang, H. B.
 Patterson, A. M.
 Raymond, C. S.
 Underhill, E. C.

South Hadley Falls (SOUTH HADLEY).

Doonan, H. E.
 Leland, F. LeR.

South Hamilton (HAMILTON).

Davis, C. H.

SOUTHAMPTON (Hampshire).

South Lincoln (LINCOLN).

Blodgett, S. H.
 Hart, J. S.

South Natick (NATICK).

Hills, C. E.

South Sudbury (SUDBURY).

Oviatt, G. A.

South Weymouth (WEYMOUTH).

Emerson, G. E.
Granger, K. H.
Mayberry, E. N.
Tirrell, V. M.

SOUTHWICK (Hampden).**SPENCER (Worcester).**

Austin, J. C.
Peck, A. F.
Sanborn, F. J.

SPRINGFIELD (Hampden).

(See also: Indian Orchard.)

Adams, C. B.
Adams, E. B.
Anthony, J. C.
Bacon, T. S.
Baldwin, E. E.
Bates, E. A.
Benner, R. S.
Birnie, J. M.
Blair, O. R.
Boyd, F. F.
Boyd, J. V. W.
Boyer, J. N.
Brigham, F. C.
†Brooks, L. S.
Brown, D. J.
Brown, E. M.
Budington, H. F.
Burke, G. H.
Byrnes, H. F.
Calkins, C. H.
Calkins, I. R.
†Calkins, Marshall
Camfill, R. E.
Carleton, Dudley
Carleton, Ralph
Chapin, D. L.
Chapin, L. D.
Chapin, W. A. R.
Chapin, W. H.
Chapman, C. R.
Claffy, J. McM.
Clapp, A. M.
†Clark, David
Cort, P. M.
Craig, W. G.
Dalton, G. F.
Davidson, H. J. D.
Davis, E. L.
Deane, W. H.
Dexter, F. F.
Dillon, M. J.
Downey, C. J.
Dubois, E. C.
Eastman, A. C.
†Edes, R. T.
Emerson, H. C.
Everett, F. L.
Finch, G. H.
Foss, G. H.
Galvin, A. H.
Gates, E. A.
Gaylord, J. F.
Gilchrist, J. M.
Godfrey, T. F.
Goodell, William
Graham, J. P.
Guild, E. H.
Harriman, D. E.
Herrick, J. T.
Hewitt, C. E.
Hill, I. C.
Hillard, J. P.
Hirsch, H. L.
Hopkins, F. E.
Hosley, W. A.
Hubbard, G. W.
Irwin, V. J.

SPRINGFIELD (continued).

Johnston, C. C.
Judd, E. H.
Jurist, Charles
Keefe, D. E.
Kilroy, Philip
Kinloch, R. A.
La Rochelle, F. D.
Leary, W. C.
Lewandowski, J. M.
Lewis, S. A.
Lynch, C. F.
Lynch, P. M.
McClean, G. C.
McKechnie, F. J.
Mahoney, E. J.
Maloney, J. M.
Martin, H. C.
McGinity, J. T.
Merritt, V. S.
Moody, F. F.
Moriarty, P. M.
Mulcahy, W. E.
Myers, E. Y.
Naurison, J. Z.
†Nims, E. B.
Ober, R. B.
Parmelee, W. J.
Peck, R. H.
Rabinovitz, Bernard
†Rice, A. R.
Rice, A. G.
Ritter, Henry
Rumrill, S. D.
Russell, S. J.
Russell, W. B.
Ryan, S. E.
Schadt, G. L.
Schillander, C. A.
Seelye, R. H.
Shaw, W. A.
Slutskin, M. L.
Smith, H. L.
Smith, W. A.
Spaid, C. J.
Squier, A. O.
†Stebbins, G. S.
Stoddard, M. J.
Stoneman, E. A.
Street, C. E.
Streeter, J. F.
Sullivan, E. C.
Sullivan, J. C.
Sweeney, E. J.
Sweet, F. B.
Tracy, J. M.
Van Allen, H. W.
Weiser, W. R.
Weston, G. D.
White, B. P.
Wilbur, S. M.
Wilcox, H. H.
Williams, A. C.
†Woods, G. L.
Zimmerman, Henry

State Farm (BRIDGEWATER).

Baker, L. A.
Emerson, E. B.
Farrar, L. O.
Kenney, C. B.
Weller, J. H.

STERLING (Worcester).

Devere, F. H.

STOCKBRIDGE (Berkshire).

Eaton, H. D.
Riggs, A. F.
Stockwell, H. E.

STONEHAM (Middlesex East).

Blenkhorn, James
Hersam, M. P.
Kerrigan, J. H.
Nickerson, G. W.
Park, F. E.
Sheehan, M. D.

STOUGHTON (Plymouth).

Faxon, N. W.
Faxon, W. O.

STOW (Middlesex South).**STURBRIDGE (Worcester).**

(See also: Fiskdale.)

SUDBURY (Middlesex South).

(See also: South Sudbury.)

SUNDERLAND (Franklin).

Moline, Charles

SUTTON (Worcester).

(See also: Manchaug.)

SWAMPSCOTT (Essex South).

Bicknell, R. E.
Godfrey, J. W.
Crimes, Loring
Lowd, H. M.

SWANSEA (Bristol South).

†Wellington, J. L.

TAUNTON (Bristol North).

(See also: East Taunton.)

Atwood, C. A.
†Bassett, E. J.
Beaulieu, F. X.
Clark, T. F.
Crandell, A. R.
Cusick, T. F.
Dean, R. D.
†Deane, A. S.
Fox, W. Y.
Galligan, E. J.
Goss, A. V.
Hubbard, F. A.
Leahey, C. B.
MacDonald, D. F.
McGraw, A. J.
Milot, A. F.
Murphy, E. F.
Murphy, F. A.
Murphy, J. B.
Murphy, J. L.
O'Brien, J. F.
†Paize, Nomus
†Perry, Martha
Pierce-Higgins, Eudora
†Presbrey, S. D.
Provost, R. G.
Ripley, H. G.
Robinson, T. J.
Sayles, J. B.
White, H. A.

TEMPLETON (Worcester North).

(See also: Baldwinville.)
Greenwood, S. E.

TWESBURY (Middlesex North).

Coburn, H. R.
DeWolf, C. W.
Flaherty, E. J.
Hanson, W. T.
Holmes, H. F.
Larrabee, H. M.
Lindsay, J. C.

TEWESBURY (continued).

Nichols, J. H.
Ferry, Sherman
Roach, A. J.
Strom-Lindsay, Marie
Willoughby, E. C.

Thorndike (PALMER).

Dunphy, H. A.

Three Rivers (PALMER).

Giroux, Charles
Miller, S. O.

TISBURY (Bristol South). No P. O.

Post Office address, Vineyard Haven.

Davis, S. T.
Mayhew, O. S.

TOLLAND (Hampden).

TOPSFIELD (Essex South).

Baxter, C. P.
Sanborn, Byron

TOWNSEND (Worcester North).

(See also: West Townsend.)

TREURO (Barnstable).

Turner's Falls (MONTAGUE).

Kemp, H. M.
Leary, P. F.
McGillicuddy, R. A.
Messer, C. C.

TYNGSBOROUGH (Middlesex North).

Lambert, F. De F.

TYRINGHAM (Berkshire).

UPTON (Worcester).

UXBRIDGE (Worcester).

Griswold, M. L.
Johnson, W. L.

Waban (BROOKLINE).

Bessey, E. E.

Waban (NEWTON).

McGee, F. M.

WAKEFIELD (Middlesex East).

Crosby, L. M.
Dutton, Charles
Dutton, Richard
Elder, F. O.
Heath, J. W.
†Jordan, Charles
O'Leary, J. A.
Sopher, C. L.
Tyzzer, E. E.
Woodbury, F. T.

WALES (Hampden).

WALPOLE (Norfolk).

(See also: East Walpole.)
Fenton, A. A.
Fuller, F. H.
Proctor, T. M.

WALTHAM (Middlesex South).

Bell, Conrad
Collins, Richard
Courtney, T. J.
Cousins, N. W.
Dascombe, O. L.
Dennen, R. W.

WALTHAM (continued).

Desmond, C. F.
Fourtin, E. R. P.
Fuller, C. B.
Hinchey, Richard
Holbrook, Bradbury
Hoyt, W. S.
Jarvis, W. F.
Lewis, J. P.
MacDonald, F. L.
Mackenzie, R. C.
McCormick, C. J.
Mosher, M. J.
O'Donnell, G. T.
Stiles, F. M.
Taylor, R. A.
Willis, C. A.
Wood, H. A.
Worcester, Alfred
Young, A. R.

WARE (Hampshire).

†Blodgett, A. G.
Gafney, H. D.
Miner, W. W.
Pearson, M. W.
Ryan, D. M.

WAREHAM (Bristol South).

Morse, C. E.

WARREN (Worcester).

DeLand, C. A.
†Phelps, O. W.

WARWICK (Franklin).

Goldsbury, P. W.

WASHINGTON (Berkshire).

WATERTOWN (Middlesex South).

Chase, C. O.
Creely, O. S.
†Davenport, B. F.
Higginbotham, F. A.
Kelley, E. J.
Meserve, E. A.
Robie, A. H. P.

Waverley (BELMONT).

Abbot, E. S.
Clark, L. B.
Fernald, W. E.
Hoch, T. A.
Packard, F. H.
Russell, F. J.
Tuttle, G. T.
Wallace, A. M.
Warren, L. M.
Whitney, R. L.
Woodill, E. E.

WAYLAND (Middlesex South).

WEBSTER (Worcester).

Bragg, L. R.
Généreux, J. O.
Hart, G. F.
Littlefield, G. C.
Roy, J. N.
Thompson, J. J.

WELLESLEY (Norfolk)

(See also: Wellesley Hills.)
Anthony, G. C.
Bancroft, E. A.
Hatch, Royal
Proctor, F. I.
Raymond, K. P.
†Stone, M. C.
White, L. E.

Wellesley Hills (WELLESLEY).

Cleveland, H. H.
Greenwood, Allen
†Hazelton, I. H.
Hewins, P. W.
Jones, G. N.
†Macdonald, W. L.
Schofield, O. L.
Stanwood, F. A.

WELLFLEET (Barnstable).

Bell, C. J.

WENDELL (Franklin).

WENHAM (Essex South).

West Acton (ACTON).

Staples, Hall

WESTBOROUGH (Worcester).

Ayer, T. H.
Cilley, D. P.
Clark, A. U. F.
Knight, C. S.
Mahoney, W. F.
Newton, R. S.

WEST BOYLSTON (Worcester).

WEST BRIDGEWATER (Plymouth).

WEST BROOKFIELD (Worcester).

Cowles, F. W.

West Dennis (DENNIS).

Osborne, E. S.

West Falmouth (FALMOUTH).

†Cutter, Ephraim

WESTFIELD (Hampden).

Atwater, J. B.
Brace, G. W.
Chadwick, H. D.
Chisholm, M. D.
Clark, F. T.
Davis, F. D.
Douglas, A. J.
Dutton, J. M.
Janes, G. H.
Maroney, P. J.
Marr, R. McC.
Noble, A. F.
Smith, E. S.

WESTFORD (Middlesex North).

Sherman, W. H.
Wells, O. V.

West Gardner (GARDNER).

Donnelly, J. B.

WESTHAMPTON (Hampshire).

West Harwich (HARWICH).

Nickerson, J. P.

West Medford (MEDFORD).

Bean, C. F. K.
Drake, R. A.
†Wight, D. W.
Wilkins, S. H.

West Medway (MEDWAY).

†Bemis, C. A.
Quint, N. P.

WESTMINSTER (Worcester North).

Kelley, C. M.

WEST NEWBURY (Essex North).
†Warren, Orin**West Newton (NEWTON).**

Atkinson, L. D. R.
 Chandler, Harold B.
 Chandler, Henry B.
 Fisher, I. J.
 Jack, L. H.
 Knowles, W. F.
 Lowe, F. M.
 Macomber, Donald
 Nielsen, E. B.
 Paine, N. E.
 Sherman, F. M.
 Wells, D. W.

WESTON (Middlesex South).

Albee, K. T.
 Robbins, Chandler
 Van Nüys, Fresenius
 Worthen, C. F.

WESTPORT (Bristol South).

Burt, E. W.

West Quincy (QUINCY).

Ash, J. H.
 Dion, T. J.

**West Roxbury (Roxbury)
(BOSTON).**

Gorham, G. H.
 Hamilton, B. E.
 Howell, W. W.
 Jilison, F. C.
 Knight, C. L.
 Knudson, M. M.
 Lougee, J. L.
 Reagh, A. L.
 Shadman, A. J.
 Stevens, H. B.
 Stevens, S. E.
 Tenney, J. A.
 Watters, W. H.

West Somerville (SOMERVILLE).

Ayres, H. W.
 Blake, A. H.
 Bond, W. L.
 Bryant, G. W.
 Cholerton, Herbert
 Gillis, J. E.
 Hoole, J. E.
 Liverpool, C. H.
 McLean, J. A.
 Mahoney, G. C.
 †Makechnie, H. P.
 Miles, G. A.
 Osgood, G. E.
 Pillsbury, E. D.
 Pote, L. H.
 Richardson, C. A. C.
 Roderick, C. E.
 Ruston, W. D.
 Sylvester, N. R.
 Wagner, E. S.
 Whitcher, B. R.

WEST SPRINGFIELD (Hampden).
(See also: Mittineague.)

Bostick, W. J.
 Corcoran, G. B.

WEST STOCKBRIDGE (Berkshire).

Leonard, Z. L.

WEST TISBURY (Bristol South).**West Townsend (TOWNSEND).**
Ely, R. S.**WESTWOOD (Norfolk).****WEYMOUTH (Norfolk South).**

(See also: East, North and South
 Weymouth.)
 Chase, Joseph, Jr.
 Jacoby, Rudolph
 Pease, L. W.

WHATELY (Franklin).**Whittinsville (NORTHBRIDGE).**

Balmer, W. E.
 Barry, E. W.
 Harriman, C. H.

WHITMAN (Plymouth).

Atwood, B. L.
 Beaulieu, E. J.
 †Copeland, H. F.
 Dyer, E. A.
 Hanley, F. J.
 Lovell, C. E.
 MacKeen, A. A.
 Pulsifer, W. H.
 Rood, A. D.

WILBRAHAM (Hampden).

(See also: North Wilbraham.)

WILLIAMSBURG (Hampshire).

(See also: Haydenville.)
 Hayes, J. G.

WILLIAMSTOWN (Berkshire).

(See also: Blackinton.)
 Adriance, Vanderpoel
 Howard, F. H.
 †Mather, E. E.

Willimansett (CHICOPEE).

Mead, F. A.

WILMINGTON (Middlesex East).

Buzzell, D. T.

WINCHENDON (Worcester North).

Henry, J. G.
 Holzer, W. F.
 Kenney, W. C.
 Pelletier, A. G.
 Sullivan, M. G.

WINCHESTER (Middlesex East).

Allen, C. J.
 Brown, A. L.
 Cummings, M. A.
 Cutter, I. T.
 Dennett, D. C.
 Gale, H. A.
 Hammond, Philip
 Hersey, H. W.
 †Hildreth, J. L.
 Lowell, W. H.
 McCarthy, C. F.
 Mead, G. N. P.
 Ordway, C. E.
 Putnam, Ralph
 Tozier, C. H.

WINDSOR (Berkshire).**WINTHROP (Suffolk).**

Adams, L. D.
 Coates, E. A.
 French, G. H.
 Grainger, E. J.
 Halsall, M. E.
 Johnson, O. E.
 Metcalf, B. H.
 Morse, F. H.
 Parker, R. B.
 Soule, H. J.
 White, L. N.

WOBURN (Middlesex East).

Bixby, J. P.
 Blake, H. G.
 Carroll, J. P.
 Caulfield, T. E.
 Chalmers, Robert
 Conlin, R. E.
 Hutchings, J. H.
 Keleher, W. H.
 Lane, A. C.
 Lane, C. G.
 McCormick, J. J.
 O'Brien, C. T.
 Stewart, V. C.
 Tedford, A. H.
 West, F. O.

Wollaston (QUINCY).

Adams, C. S.
 Champion, M. E.
 Curtis, W. G.
 Merritt, L. A.

WORCESTER (Worcester).

Adamian, P. A.
 Adams, G. E.
 Albee, G. M.
 Andrews, B. F.
 Arey, H. C.
 Atwood, A. W.
 Auger, L. L.
 Ayers, C. E.
 Baft, Max
 Baker, F. H.
 Balcom, K. I.
 Barnes, J. A.
 Barrell, M. E.
 Barry, R. G.
 Beal, H. W.
 Bergin, S. A.
 Berry, Gordon
 †Berry, J. C.
 Bieberbach, W. D.
 Bigelow, E. B.
 Bowers, G. F. H.
 Boyden, A. H.
 Brennan, J. J.
 Brown, G. C.
 Bryant, Frederick
 Bunker, S. M.
 Burley, B. T.
 Byrne, C. J.
 Cahill, J. W.
 Carey, F. H.
 Carney, P. J.
 Cassels, L. R.
 Charteris, M. A.
 Clark, W. I., Jr.
 Clement, M. W.
 Colberg, P. A.
 Cook, P. H.
 Cronin, H. W.
 Cronin, T. J.
 Cross, A. E.
 Cummings, J. J.
 Curran, J. F.
 Cutler, R. W.
 Daudelin, S. A.
 Deering, G. E.
 Delahanty, W. J.
 Denning, W. E.
 Disbrow, E. P.
 Dix, G. A.
 Dixon, Arthur
 Dolan, W. E.
 Donoghue, J. J.
 Donoghue, J. J.
 Drew, C. A.
 Duggan, J. T.

WORCESTER (continued).

Emerson, B. K.
 Emery, G. E.
 Estabrook, C. T.
 Everett, O. H.
 Fallon, M. F.
 Farnham, J. M. W.
 Fay, F. G.
 Fitzgerald, C. P.
 Flynn, J. J.
 Fogerty, W. C.
 Foley, T. J.
 Foskett, G. M.
 Fox, M. B.
 Fraim, I. W.
 Fuller, S. C.
 Gage, Homer
 George, F. W.
 Getchell, A. C.
 Gilfillan, D. R.
 Gilman, W. R.
 Gosline, H. I.
 Greene, R. W.
 Gwynne, S. C.
 Hagerty, H. J.
 Haigh, G. W.
 Halloran, M. J.
 Harkins, J. F.
 Harrower, David
 Hartnett, J. H.
 Haviland, W. C.
 Hill, G. H.
 Holmes, M. S.
 Horsman, H. L.
 Hunt, E. L.
 Jackson, A. W.
 Jackson, R. C.
 Jewett, E. P.
 †Jordan, G. A.
 Kenney, T. F.
 Kenyon, H. J.
 Kinnicutt, Roger
 Lemaire, W. W.
 Lincoln, G. C.
 Lincoln, Merrick
 Lindsay, J. I.
 Lovell, D. B.
 Lussler, C. A.
 Lynch, W. F.

WORCESTER (continued).

McClusky, H. L.
 MacFadyen, J. A.
 MacKerrow, H. G.
 Magune, F. L.
 †Marble, J. O.
 Marsh, A. W.
 Masten, B. H.
 Marston, C. H.
 Mathews, R. F.
 McDonald, J. W.
 McEvoy, T. E.
 McGillicuddy, J. T.
 McIntosh, J. G.
 McIvor, G. A.
 McKibben, W. W.
 McKoan, J. W.
 McSheehy, T. C.
 Miller, L. C.
 Moore, J. F.
 Mott, G. E.
 Murphy, A. F.
 Nightingale, James
 O'Callaghan, M. V.
 O'Connell, A. E.
 O'Connor, D. F.
 O'Connor, J. F.
 O'Connor, J. W.
 O'Day, G. F.
 O'Meara, M. J.
 Osborne, C. A.
 Overlock, M. G.
 Parker, E. L.
 Peterson, H. O.
 Phelps, O. D.
 Pofcher, E. H.
 Power, G. A.
 †Quinby, H. M.
 Randall, C. W.
 Rice, J. E.
 Robinson, Solomon
 Rochette, E. C.
 Rockwell, A. E. P.
 Rose, W. H.
 Schofield, R. W.
 Scribner, E. V.
 Seelye, W. C.
 Shannahan, R. J.
 Shattuck, A. M.

WORCESTER (continued).

Shaw, T. B.
 Shea, P. O.
 Simmons, E. B.
 Simmons, H. C.
 Smith, E. E.
 Smith, Myrtle
 Sparrow, C. A.
 Stansfield, O. H.
 Stapleton, R. H.
 Stevens, C. B.
 Stevens, W. C.
 Stick, H. L.
 Stowell, F. E.
 Swan, R. W.
 Swasey, Edward
 Taylor, James, Jr.
 Tripp, G. A.
 Trowbridge, E. H.
 Ward, G. O.
 Ward, R. J.
 Watkins, R. P.
 Wetherbee, L. E.
 Wheeler, C. D.
 Wheeler, Leonard
 Whitaker, C. W.
 White, Levi
 Woodward, L. F.
 Woodward, S. B.
 †Workman, W. H.
 Yoosuf, A. K.

WORTHINGTON (Hampshire).

Barrows, Sterling
 Lyman, W. R.

WRENTHAM (Norfolk).

Faxon, E. W.
 Ferguson, E. H.
 Perkins, F. H.
 Wallace, G. L.

YARMOUTH (Barnstable).

(See also: Yarmouth Port.)

Yarmouth Port (YARMOUTH).

Sears, S. H.

NON-RESIDENTS, BY STATES AND COUNTRIES

1915

CALIFORNIA.

Boyd, S. G., San Francisco.
 †Crocker, S. E., Los Angeles.
 Dwight, H. L., Copperopolis.
 Goss, F. W., Sacramento.
 Johnson, W. S., Los Angeles.
 Holt, H. A., Pasadena.
 Lucas, W. P., San Francisco.
 Mansur, L. W., Los Angeles.
 Parker, A. M., Santa Maria.
 Pherson, P. H., San Francisco.
 Shea, J. J., San Diego.
 †Stephenson, F. B., Claremont.
 Taylor, J. G., Los Angeles.
 Williams, C. C., Pasadena.

CONNECTICUT.

†Bragdon, G. A., Middletown.
 Browne, W. T., Norwich.
 Chamberlin, H. A., Hartford.
 Cox, S. F., New Haven.
 LaMoure, C. T. E., Lakeville.
 Lowe, L. J., Higganum.
 Lord, S. A., Cromwell.
 †Page, C. W., Hartford.
 †Swan, W. C., Branford.

FLORIDA.

Swift, M. B., Orlando.
 Vaughan, J. H., Tampa.

GEORGIA.

Comey, P. P., Augusta.

ILLINOIS.

Holt, F. H., Chicago.

INDIANA.

Bliss, G. S., Fort Wayne.
 Woodbury, H. E., Indianapolis.

IOWA.

Grover, A. L., Iowa City.

KENTUCKY.

Lawrence, N. L., Louisville.

MAINE.

Allen, S. W., York Harbor.
 Averill, G. G., Waterville.
 Cummings, D. F., Cherryfield.
 Eastman, T. J., South Berwick.
 Hall, W. D., Port Clyde.
 Hedra, C. J., West Pownal.
 Hills, F. L., Bangor.
 Jackson, F. W., Jefferson.
 O'Brien, C. R., Bangor.
 Reynolds, R. L., Waterville.
 Richardson, H. K., Bradford.
 Stevens, H. E. E., Lewiston.
 Swift, H. M., Portland.
 Vosburgh, S. E., Augusta.
 Williams, H. E., Mount Vernon.

MARYLAND.

Quinby, W. C., Baltimore.

MICHIGAN.

Hendricks, H. V., Traverse City.
 Noble, A. I., Kalamazoo.

MINNESOTA.

†Hayes, C. C., Fairbault.
 McGrath, B. F., Rochester.
 Marley, W. J., Minneapolis.
 Tomkies, J. S., Rochester.

MISSOURI.

Murphy, F. T., St. Louis.

NEW HAMPSHIRE.

Allen, Bradford, Nashua.
 †Balcom, G. F., Swanzey.
 †Blood, R. A., George's Mills.
 Bowles, G. H., Plymouth.
 Bradford, H. W., Wolfborough.
 Brownrigg, A. E., Nashua.
 Butterfield, G. K., Reed's Ferry.
 Cain, W. G., Nashua.
 Faulkner, H. K., Keene.
 Glie, J. M., Hanover.
 Graves, R. J., Concord.
 Holmes, J. F., Manchester.
 Hubbard, O. H., Gilsom.
 Kean, M. E., Manchester.
 Laton, G. P., Salem.
 Libby, M. G., Newport.
 MacMillan, A. L., Jr., Concord.
 Parker, W. A., Bethlehem.
 Pike, F. W., Portsmouth.
 Powell, M. A., Laconia.
 Proctor, J. D., Keene.
 Smith, C. S., Manchester.
 Stowell, E. C., Dublin.
 Stowell, S. R., Dublin.
 Taft, A. A., Keene.
 Thorpe, B. D., Newport.
 Tower, E. A., Derry.
 Wallace, A. S., Nashua.
 Wilkins, G. C., Manchester.

NEW JERSEY.

Christiernin, C. L., East Orange.
 Dunham, H. B., Glen Gardner.
 Ferguson, R. H., East Orange.
 Hahn, A. J., Pattenburg.
 Smith, Theobald, Princeton.

NEW YORK.

Breed, N. P., Douglaston, L. I.
 Bryant, W. S., New York.
 Coollidge, J. N., New York.
 Fisher, C. I., New York.
 Fisk, A. L., New York.
 Holden, E. M., New York.
 Laighton, F. M., New York.
 McKay, W. H., Poughkeepsie.
 McCarthy, T. F., Jamaica, L. I.
 McPherson, Ross, New York.
 Monty, A. H., Brooklyn.
 Ogden, J. B., New York.
 Ordway, Thomas, Albany.
 Overlander, J. L., New York.
 Pratt, M. R., Syracuse.
 Richards, C. M., New York.
 Shominger, L. S., New York.
 Smith, S. B., New York.
 Tibbetts, J. T., Mineola.

NORTH CAROLINA.

Achorn, J. W., Pine Bluff.
 Packard, G. H., White Rock.

OHIO.

Schwab, Emanuel, Cincinnati.
 Wells, A. T., Canton.

OREGON.

Whiteside, G. S., Portland.

PENNSYLVANIA.

Cockett, M. S., Bryn Mawr.
 Finlayson, A. D., Warren.
 Fuller, D. H., Philadelphia.
 Law, K. H., Erie.
 McRae, A. J., Wilkes-Barre.
 Mitchell, H. W., Warren.
 Simonds, O. F., Philadelphia.
 Wheeler, L. A., Wernersville.

PORTO RICO.

Couch-Mora, M. C., Fajaydo.

RHODE ISLAND.

Blake, LeGrande, Riverside.
 Borden, G. E., Adamsville.
 Darrah, R. E., Newport.
 Davenport, J. H., Providence.
 Gerber, Isaac, Providence.
 Hamblet, M. L., Wallum.
 Hayes, A. E., Providence.
 Holt, C. H., Pawtucket.
 Keefe, P. H., Providence.
 MacLeod, N. M., Newport.
 Means, P. C., Apponaug.
 Messinger, H. C., Providence.
 Munro, W. L., Providence.
 Murphy, E. V., Newport.
 O'Meara, J. G., Providence.
 Pettingill, O. S., Wallum Lake.
 Sullivan, J. E., Providence.
 Turner, C. S., Providence.

SOUTH CAROLINA.

Laws, S. G., Spartanburg.

TEXAS.

Slater, E. M., Denton.

VERMONT.

Bush, A. D., Burlington.
 Higgins, J. H., Union Village.
 Marshall, A. T., Chelsea.

WEST VIRGINIA.

Boland, L. F., Welch.

WISCONSIN.

Greeley, H. P., Waukesha.

WYOMING.

Berry, L. M., Junction.

DISTRICT OF COLUMBIA.

Hopkins, J. W., Washington.
 Murphy, J. P. H., Washington.

PANAMA CANAL ZONE.

Bates, L. B., Ancon.

U. S. ARMY.

Bauer, L. H.
 Morse, C. F.
 Newton, R. W.
 Wood, Leonard.

U. S. NAVY.

Jenness, B. F.
 Moran, C. L.

FOREIGN.

Calkin, B. H., Stellarton, N. S.
 Clark, H. A., Port Limon, Costa Rica.
 Hanley, J. J., Motherwell, Scotland.
 McKelvey, A. D., Toronto, Canada.
 MacPherson, W. E., St. Marc, Haiti.
 †Prince, J. P., Durban, South Africa.
 Storrs, H. R., Vancouver, B. C.
 Street, L. A. B., Shanghai, China.
 Townsend, David, River Glade, N. B.

ADDRESS UNKNOWN.

Baker, Osmyn.
 Brown, Melvin James.
 †Brown, Marshall Lebanon.
 Canfield, William Chase.
 Ermentrout, Sallie Justina.
 Hinds, Robert Watson.
 Metcalf, Julia Tracy.
 †Phipps, Walter Andros.
 Sears, Julia Seaton.
 Smith, Frank Simpson.
 Tracy, Thomas Henry.

NUMERICAL SUMMARY OF FELLOWS BY DISTRICTS

GIVING CITIES AND TOWNS

[Names of Cities are printed in Capitals.]

1915

BARNSTABLE DISTRICT.

Established 28 May, 1840.

Barnstable	7	Orleans	1
Bourne	2	Provincetown	3
Brewster	1	Sandwich	3
Chatham	1	Truro	1
Dennis	3	Wellfleet	1
Eastham	1	Yarmouth	1
Falmouth	4		
Harwich	5	Total	32
Mashpee			

Active 30. Retired 2.

BERKSHIRE DISTRICT.

Established 7 Oct., 1807.

Adams	4	NORTH ADAMS	11
Alford		Otis	
Becket	1	Peru	
Cheshire		PITTSFIELD	42
Clarksburg		Richmond	
Dalton	3	Sandisfield	
Egremont		Savoy	
Florida		Sheffield	1
Great Barrington	6	Stockbridge	3
Hancock		Tyringham	
Hinsdale		Washington	
Lanesborough	1	West Stockbridge	1
Lee	2	Williamstown	4
Lenox	2	Windsor	
Monterey			
Mount Washington		Total	82
New Marlborough			

Active 79. Retired 3.

BRISTOL NORTH DISTRICT.

Established 31 May, 1849.

Attleborough	12	Norton	1
Dighton	1	Raynham	
Dartmouth	3	Rehoboth	
Easton	1	Seekonk	
Freetown	1	TAUNTON	31
Lakeville*	1		
Mansfield	5	Total	64
Middleborough*	4		
North Attleborough	5		

Active 58. Retired 6.

BRISTOL SOUTH DISTRICT.

Established 3 April, 1839.

Acushnet		NEW BEDFORD	64
Chilmark		Oak Bluffs	
Dartmouth	2	Rochester	
Edgartown	1	Somerset*	
Fairhaven	2	Swansea*	1
FALL RIVER	57	Tisbury	2
Gay Head		Wareham	1
Gosnold		Westport	1
Marion	2	West Tisbury	
Mattapoisett	2		
Nantucket	2	Total	137

Active 132. Retired 5.

ESSEX NORTH DISTRICT.

Established 6 Oct., 1841.

Amesbury	9	Newbury	
Andover	6	NEWBURYPORT	15
Boxford		North Andover	2
Georgetown	3	Rowley	1
Groveland	1	Salisbury	
HAVERHILL	50	West Newbury	1
LAURENCE	65		
Merrimac	1	Total	159
Methuen	5		

Active 154. Retired 5.

ESSEX SOUTH DISTRICT.

Established 7 June, 1804.

BEVERLY	19	Nahant	1
Danvers	12	Peabody	10
Essex	1	Rockport	3
GLOUCESTER	20	SALEM	36
Hamilton	2	Saugus	7
Ipswich	3	Swampscott	4
LYNN	100	Topsfield	2
Lynnfield	1	Wenham	
Manchester	2		
Marblehead	5	Total	229
Middleton	1		

Active 222. Retired 7.

FRANKLIN DISTRICT.

Established 27 May, 1851.

Ashfield	1	Monroe	
Barnardston	2	Montague	6
Buckland		New Salem	
Charlemont		Northfield	3
Colrain	2	Orange	3
Conway		Rowe	
Deerfield	3	Shelburne	3
Erving	1	Shutesbury	
Gill		Sunderland	1
Greenfield	12	Warwick	1
Hawley		Wendell	
Heath		Whately	
Leverett			
Leyden		Total	38

Active 37. Retired 1.

HAMPDEN DISTRICT.

Established 28 May, 1840.

Agawam	1	Montgomery	
Blandford		Palmer	10
Brimfield	1	Russell	
Chester	1	Southwick	
CHICOPEE	8	SPRINGFIELD	135
Granville	1	Tolland	
Hampden		Wales	
Holland		Westfield	13
HOLYOKE	16	West Springfield	3
Longmeadow	1	Wilbraham	1
Ludlow	1		
Monson	4	Total	226

Active 217. Retired 9.

* By vote of the Council, June 7, 1910, Somerset and Swansea were transferred to Bristol South, and Lakeville and Middleborough to Bristol North.

HAMPSHIRE DISTRICT.

Established 5 Oct., 1831.

Amherst	7	NORTHAMPTON	28
Belchertown	1	Pelham	—
Chesterfield	—	Plainfield	—
Cummington	2	Prescott	—
Easthampton	6	Southampton	—
Enfield	1	South Hadley	6
Goshen	—	Ware	5
Granby	—	Westhampton	2
Greenwich	—	Williamsburg	3
Hadley	2	Worthington	2
Hatfield	3	—	—
Huntington	3	Total	69
Middlefield	—		

Active 64. Retired 5.

MIDDLESEX EAST DISTRICT.

Established 2 Oct., 1850.

Burlington	—	Wilmington	1
MILROSE	13	Winchester	15
North Reading	3	WOBURN	15
Reading	7	—	—
Stoneham	6	Total	73
Wakefield	10		

Active 70. Retired 3.

MIDDLESEX NORTH DISTRICT.

Established 2 Oct., 1844.

Acton	1	Groton	1
Bedford	2	Littleton	—
Billerica	2	LOWELL	88
Boxborough	—	Pepperell	2
Carlisle	—	Tewksbury	12
Chelmsford	3	Tyngsborough	1
Draught	—	Westford	2
Dunstable	—	Total	114

Active 108. Retired 6.

MIDDLESEX SOUTH DISTRICT.

Established 2 Oct., 1850.

Arlington	13	MARLBOROUGH	6
Ashland	1	Maynard	1
Belmont	16	MEDFORD	19
Brighton	24	Natick	8
CAMBRIDGE	121	NEWTON	65
Charlestown*	20	Sherborn	—
Concord	6	SOMERVILLE	72
EVERETT	17	Stow	—
Frammingham	20	Sudbury	1
Holliston	4	WALTHAM	25
Hopkinton	—	Watertown	7
Hudson	2	Wayland	—
Lexington	7	Weston	4
Lincoln	3	—	—
MALDEN	42	Total	529

* A part of Boston.

Active 508. Retired 21.

NOFOLK DISTRICT.

Established 2 Oct., 1850.

Bellingham	—	Milton	10
Brookline	107	Needham	8
Canton	4	Norfolk	—
Dedham	7	Norwood	8
Dorchester*	116	Roslindale*	14
Dover	1	Roxbury*	123
Foxborough	6	Sharon	3
Franklin	2	Walpole	4
Hyde Park*	8	Wellesley	15
Jamaica Plain*	15	West Roxbury*	13
Mattapan*	15	Wrentham	4
Medfield	1	—	—
Medway	3	Total	537
Mills	—		

Active 517. Retired 20.

NORFOLK SOUTH DISTRICT.

Established 1 Oct., 1884.

Braintree	7	QUINCY	29
Cohasset	3	Randolph	3
Hingham	5	Weymouth	11
Holbrook	3	—	—
Hull	2	Total	63

Active 63.

PLYMOUTH DISTRICT.

Established 2 Oct., 1850.

Abington	6	Norwell	—
Avon	2	Pembroke	1
Bridgewater	10	Plymouth	8
BROCKTON	53	Plympton	—
Carver	—	Rockland	4
Duxbury	3	Scituate	2
East Bridgewater	—	Stoughton	2
Halifax	—	West Bridgewater	—
Hanover	2	Whitman	9
Hanson	1	—	—
Kingston	1	Total	106
Marshfield	3		

Active 100. Retired 6.

SUFFOLK DISTRICT.

Established 7 June, 1804.

BOSTON*	614	Winthrop	10
CHELSEA	8	—	—
Revere	9	Total	641

Active 622. Retired 19.

* Except Brighton and Charlestown, which are in the Middlesex South District, and Dorchester, Hyde Park, Jamaica Plain, Mattapan, Roslindale, Roxbury, West Roxbury, and that part of Boston lying south of a line beginning at Dorchester Bay opposite end of Preble Street, and running in a general north-easterly direction through the middle of Preble and Swett (now Southampton) Streets to Northampton Street, then by the middle of Northampton Street to Washington Street, then by the middle of Washington Street to Camden Street, then by the middle of Camden and Gainborough Streets to Huntington Avenue, then by the middle of Huntington Avenue to the Huntington Avenue entrance of the Back Bay Park, then across the Park westerly to the waterway known as Muddy Brook, then by Muddy Brook to St. Mary's Street, then by the middle of St. Mary's Street to the Charles River, which are in the Norfolk District.

WORCESTER DISTRICT.

Established 7 June, 1804.

Auburn	2	Northborough	2
Barre	2	Northbridge	3
Berlin	1	North Brookfield	1
Blackstone	1	Oakham	3
Bolton	1	Oxford	3
Boylston	1	Paxton	1
Brookfield	3	Princeton	1
Charlton	12	Rutland	3
Clinton	1	Shrewsbury	2
Dana	1	Southborough	6
Douglas	1	Southbridge	3
Dudley	6	Spencer	1
Grafton	1	Sterling	1
Hardwick	1	Sturbridge	1
Harvard	2	Sutton	1
Holden	1	Upton	2
Hopedale	1	Uxbridge	2
Hubbardston	1	Warren	6
Lancaster	3	Webster	6
Leicester	4	Westborough	1
Mendon	4	West Boylston	1
Millford	4	West Brookfield	168
Millbury	4	WORCESTER	253
New Braintree		Total	253

Active 244. Retired 9.

WORCESTER NORTH DISTRICT.

Established 25 May, 1858.

Ashburnham	3	Phillipston	
Ashby	1	Royalston	
Athol	3	Shirley ..	4
Ayer	3	Templeton	4
FITCHBURG	35	Townsend	1
Gardner	17	Westminster	1
LEOMINSTER	11	Winchendon	5
Lunenburg	1	Total	85
Petersham			

Active 83. Retired 2.

RECAPITULATION.

DISTRICT SOCIETIES.	RETIRED	ACTIVE	TOTAL
Barnstable.....	2	30	32
Berkshire.....	3	79	82
Bristol North.....	6	58	64
Bristol South.....	5	132	137
Essex North.....	5	154	159
Essex South.....	7	222	229
Franklin.....	1	37	38
Hampden.....	9	217	226
Hampshire.....	5	64	69
Middlesex East.....	3	70	73
Middlesex North.....	6	114	120
Middlesex South.....	21	508	529
Norfolk.....	20	517	537
Norfolk South.....		63	63
Plymouth.....	6	100	106
Suffolk.....	19	622	641
Worcester.....	9	244	253
Worcester North.....	2	83	85
Fellows resident in Massachusetts.....	129	3314	3443
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	1338	3469	3607
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